

EXHIBIT 1

Ali Diabat v. Credit Suisse et al.

Expert Report of Professor Mark Garmaise

January 17, 2025

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I. Qualifications

1. I am a Professor of Finance at the Anderson School of Management at The University of California, Los Angeles (“UCLA Anderson”), and I hold the Joel Fried Chair in Applied Finance. I joined UCLA Anderson’s faculty in 2001 and received tenure in 2008. From 2016 to 2018, I served as area head of Finance for UCLA Anderson, and I was the Senior Associate Dean for the Full Time MBA Program at UCLA Anderson during the 2014–2015 term. I received my A.B. in Mathematics and Philosophy from Harvard College and my Ph.D. in Finance from Stanford University. Prior to joining the faculty at UCLA Anderson, I was an Assistant Professor at the University of Chicago Graduate School of Business.
2. I am an expert in the areas of corporate finance, valuation, entrepreneurship, real estate, and banking. In my research, I have examined the role of information in financial markets and the financing of entrepreneurial firms.
3. My research has been widely cited and published in several top-tier peer-reviewed academic journals, including *Review of Financial Studies*, *The Journal of Finance*, and *Quarterly Journal of Economics*. I have served as an Associate Editor of *Review of Financial Studies* and *Journal of Law, Finance, and Accounting*. I act as a referee for several academic journals, including *The Journal of Finance*, *Review of Financial Studies*, and *Journal of Financial Economics*. I served on the American Finance Association Nominating Committee in 2007.
4. I have taught courses on Corporate Finance and Venture Capital and Private Equity at UCLA Anderson for over twenty years. I have received numerous awards for my research and teaching, including the 2004 BGI Brennan Award for the best paper published in the *Review of Financial Studies*, the 2005 BGI Brennan Runner-up Award for the best paper published in the *Review of Financial Studies*, the 2007 Citibank Teaching Award for most outstanding MBA teacher, and the Best Paper Award in 2017 for my paper published in *The Review of Corporate Finance Studies*.
5. A copy of my curriculum vitae is included as **Appendix A**. A list of my testimony over the last four years is included as **Appendix B**.

II. Assignment

6. I have been retained by counsel for Credit Suisse Group AG (“Credit Suisse” or “the Company”), Axel Lehmann, Ulrich Korner, and Dixit Joshi (collectively, “Defendants”), to review and respond to the Expert Report of Matthew D. Cain, PhD, dated December 13, 2024 (the “Cain Report”).

7. Specifically, I have been asked to determine if Dr. Cain has proposed a methodology capable of estimating damages on a class-wide basis consistent with Plaintiff’s¹ theory of liability in this matter, including a methodology capable of estimating damages associated with the alleged misrepresentations regarding Credit Suisse’s internal control over financial reporting (“ICFR”). Separately, I have been asked to review and respond to Dr. Cain’s analyses regarding market efficiency for the Credit Suisse options and notes that are included in Plaintiff’s proposed class.

8. In formulating my opinions, I have relied on my knowledge, prior experience, academic research and teaching on relevant topics, and formal training in economics and finance. In performing my analyses, I have examined a variety of materials, including legal pleadings, academic literature, securities analyst and public press commentary, and other public data. A complete list of the materials I considered in forming my opinions is contained in **Appendix C**.

9. I am being compensated at my standard billing rate. My standard billing rate increased to \$1,200 per hour on January 1, 2025. Prior to this date, I was compensated at my then-standard billing rate of \$1,100 per hour. The staff of Cornerstone Research, who have worked at my direction, have assisted me in this matter. I receive compensation from Cornerstone Research based on its collected staff billings for its support of me in this matter. Neither my compensation in this matter nor my compensation from Cornerstone Research is in any way contingent or based on the content of my opinions or the outcome of this or any other matter.

10. My work on this matter is ongoing, and I reserve the right to modify or supplement my opinions if I become aware of additional facts, information, or contentions of the parties or any witnesses.

¹ Plaintiff (or “Lead Plaintiff”) refers to Ali Diabat, the lead plaintiff in this matter.

III. Summary of Opinions

11. Based on my analysis to date, as well as my knowledge, experience, education, and training, I have formed the following opinions.

12. **Opinion #1: Dr. Cain fails to provide a methodology that would reliably calculate damages for Credit Suisse ADSs² in a manner consistent with Plaintiff's theory of liability.**

Rather than providing a damages methodology specifically tailored to Plaintiff's theory of liability and the distinctive economic circumstances affecting Credit Suisse, Dr. Cain instead provides a list of generic descriptions of approaches that might be used to calculate damages for a securities fraud claim. His list of descriptions fails to account for various distinctive factors in this matter and is therefore flawed, for at least the following reasons:

13. *First*, a distinctive attribute of the matter at hand is that Credit Suisse's announcement on March 19, 2023 took place in the context of an extraordinary event, a regulator-facilitated merger, that occurred amidst the 2023 banking crisis that affected banks both in the U.S. and internationally. This banking turmoil included three of the four largest bank failures in U.S. history and reportedly had a "contagion effect" to European banks. Dr. Cain, however, fails to describe a damages methodology that can calculate alleged artificial inflation in Credit Suisse's ADS price that is consistent with Plaintiff's theory of liability using the price drop following such an event.

14. Specifically, Dr. Cain has not explained to what extent a hypothetical "but-for" disclosure at an earlier point during the Proposed Class Period³ from Credit Suisse would cause the market to expect a regulator-facilitated merger at the same or similar terms, including the same or similar regulatory involvement, when the earlier hypothetical disclosure would be made in the environment with no similar concerns regarding a global banking crisis. Moreover, Dr. Cain has not shown how he would be able to estimate the price impact of a hypothetical "but-for" disclosure made by Credit Suisse at an earlier point during the Proposed Class Period, had that disclosure been different from the March 19, 2023 disclosure, that is, in the presence of a different degree of regulatory involvement or in the absence of any regulatory involvement at all. I am not aware of any existing methodology from academic literature, nor has Dr. Cain offered

² I discuss the at-issue securities in this matter in **Section IV**.

³ The proposed class and Proposed Class Period are discussed in **Section IV**.

any, that is capable of reliably modeling the changes in market expectations regarding a potential future regulator-facilitated merger in such “but-for” scenarios and hence the price impact of a “but-for” disclosure over time.

15. *Second*, Dr. Cain also fails to describe a damages methodology that can account for a disclosure that reflects the materialization of risk. Specifically, Plaintiff links Credit Suisse’s disclosure on March 19, 2023, the announcement of its merger with UBS, to the materialization of a risk of customer deposit and asset outflows and deteriorating liquidity.⁴ Given that Plaintiff alleges that Defendants misled the market about the degree of a particular risk, any price decline following a materialization of risk event does not, in general, represent price inflation. Instead, any price decline reflects the price impact of risk being realized, rather than the price impact of true risk being revealed.

16. *Third*, Dr. Cain has not provided a methodology capable of estimating damages associated with the alleged misrepresentations regarding Credit Suisse’s ICFR. Specifically, while Dr. Cain has not indicated how he will measure alleged artificial security price inflation with an event study (or other generic tools), it is noteworthy that based on Dr. Cain’s ADS event study, his finding of a statistically significant price response to Credit Suisse’s March 14, 2023 ICFR disclosure is not robust. If one corrects his unsupported methodological choices, the ADS residual return on March 14, 2023, the day Credit Suisse disclosed a material weakness in its 2022 Annual Report, is no longer statistically significant at the 95% confidence level. From the perspective of financial economics, residual returns that are non-zero, but not statistically significant, are indistinguishable from zero. In addition, the findings of a “placebo” test examining the variability of stock returns of other banks around the same time also raise concerns about the reliability of using Dr. Cain’s ADS regression model to analyze the period of the 2023 banking crisis, an episode that includes March 14, 2023. Dr. Cain has thus not demonstrated that an event study using the Credit Suisse ADS price change on March 14, 2023 can be used to measure the change in inflation due to a disclosure regarding Credit Suisse’s ICFR.

⁴ I discuss materialization of risk, in the context of the merger between Credit Suisse and UBS, in **Section VI.C.2**.

17. Dr. Cain has further not demonstrated that the Credit Suisse ADS price change on March 20, 2023 can be used as part of a damages methodology to measure the change in inflation due to materialization of risks regarding Credit Suisse's ICFR. Dr. Cain fails to address the evidence that is consistent with the notion that Credit Suisse's ADS price would have already fully reflected the March 14, 2023 ICFR disclosure before March 20, 2023 if the market for Credit Suisse ADSs was efficient as Plaintiff claims.

18. **Opinion #2: Dr. Cain fails to provide a methodology that would reliably calculate damages for Credit Suisse Options in a manner consistent with Plaintiff's theory of liability.** As an initial matter, Dr. Cain's discussion of damages in relation to the Credit Suisse Options suffers from the same flaws as his discussion for the Credit Suisse ADSs. Dr. Cain only provides a vague and generic discussion of potential models that he purports could be used for analyzing options damages. Importantly, however, Dr. Cain fails to show that the only impact of the alleged misrepresentations on the value of the options would have been through the artificial inflation of the price of the underlying security (i.e., Credit Suisse ADSs). Despite conceding that the volatility of the ADS could affect the option value, he fails to explain how his proposed approach could identify "but-for" volatility applicable to each option series and therefore serve as a reliable measure of artificial inflation for the Credit Suisse Options.

19. **Opinion #3: Dr. Cain fails to provide a methodology that would reliably calculate damages for Credit Suisse Notes in a manner consistent with Plaintiff's theory of liability.** As with the other securities, Dr. Cain's vague and generic discussion of damages in relation to the Credit Suisse Notes is unreliable. Critically, he fails to account for the unique challenge that the alleged "revelatory events"⁵ in this matter had different value implications for the Credit Suisse Notes than for the Credit Suisse ADSs. Specifically, following the announcement of the Company's merger with UBS, Dr. Cain's event study shows that six out of the seven Credit Suisse Notes have *positive* and statistically significant residual returns at the 95% confidence level on March 20, 2023, while the ADSs had a statistically significant price decline. That is, these Credit Suisse Note holders apparently benefited from the takeover deal facilitated by the Swiss government. Given the opposite price reactions of the Credit Suisse Notes versus that of the ADSs in response to the key alleged "revelatory event," Dr. Cain fails to explain how his

⁵ For a discussion of the alleged "revelatory events," see **Section IV**.

methodology can be used to consistently estimate damages under the same theory of liability for investors in the Credit Suisse Notes and Credit Suisse ADSs.

20. **Opinion #4: Dr. Cain fails to reliably demonstrate that the Credit Suisse Options traded in efficient markets during the Proposed Class Period.** Dr. Cain opines in his report that the markets for Credit Suisse Options were efficient. As support for this conclusion, Dr. Cain relies on his conclusions regarding an entirely different security: the Credit Suisse ADSs. Dr. Cain also conducts a limited analysis of the directionality of price movements for a small subset of the Credit Suisse Options and dismisses the relevance of *Cammer* and *Krogman* factors. Dr. Cain's analyses are flawed, rendering his market efficiency conclusion for the Credit Suisse Options unreliable.

21. *First*, Dr. Cain's claim that a finding of market efficiency for Credit Suisse ADSs directly translates to a finding of market efficiency for the Credit Suisse Options is unsupported by the academic literature, including work cited by him. Academic studies have documented instances of persistent option mispricing, that is, evidence of market inefficiency, even on major options exchanges such as CBOE.

22. *Second*, Dr. Cain's analysis of market efficiency only covers a very small proportion (2.5%) of Credit Suisse Options series that are expected to be the most liquid and actively traded during the Proposed Class Period, even though each option series is a distinct security with its own economic characteristics.

23. *Third*, Dr. Cain's analysis of price movements for the small fraction of Credit Suisse Options series he does analyze is not supported by academic literature and does not reliably support a conclusion of market efficiency.

24. *Fourth*, most of the Credit Suisse Options series traded infrequently during the Proposed Class Period and exhibited elevated bid-ask spreads. Dr. Cain incorrectly dismisses the implications of low trading volume and high bid-ask spread for the market efficiency of the Credit Suisse Options.

25. **Opinion #5: Dr. Cain fails to reliably demonstrate that the Credit Suisse Notes traded in efficient markets during the Proposed Class Period.** Dr. Cain's *Cammer* and *Krogman* factor analyses for the notes are flawed, and therefore fail to demonstrate that the Credit Suisse Notes traded in efficient markets during the Proposed Class Period.

26. *First*, Dr. Cain’s analysis of *Cammer* Factor 5 for the Credit Suisse Notes is unreliable. Dr. Cain’s entire cause-and-effect analysis is based on only two, arbitrarily selected “news days”: one that is not even in the Proposed Class Period, and the other on which none of the Credit Suisse Notes had a statistically significant residual price return. He also inappropriately pools all Credit Suisse Notes together in conducting his statistical test, despite each note representing a distinct security with different economic characteristics.

27. *Second*, Dr. Cain’s analyses of *Cammer* Factor 1 (trading volume) and *Krogman* Factor 2 (bid-ask spread) are also flawed and unreliable. Neither of these analyses support a conclusion that the Credit Suisse Notes traded in efficient markets.

IV. Overview of Allegations

28. I understand that Plaintiff seeks to certify the following proposed class:

All those who purchased or otherwise acquired Credit Suisse Securities in domestic transactions during the period from October 27, 2022 through and including March 17, 2023 [(the “Proposed Class Period”)], excluding Defendants, officers, and directors of Credit Suisse, members of their immediate families and their legal representatives, heirs, successors, or assigns, and any entity in which Defendants have or had a controlling interest.⁶

29. The relevant “Credit Suisse Securities” are (i) Credit Suisse American Depository Shares (“Credit Suisse ADSs”), (ii) exchange-traded options on Credit Suisse ADSs (“Credit Suisse Options”); and (iii) Credit Suisse notes (“Credit Suisse Notes”).⁷ I have included a table listing the seven relevant Credit Suisse Notes as **Exhibit 1**.

⁶ Memorandum of Law in Support of Plaintiff’s Motion for Class Certification, Appointment of Plaintiff as Class Representative, and Appointment of Class Counsel, *Ali Diabat v. Credit Suisse Group AG et al.*, Case No. 1:23-cv-5874-CM-SLC, December 13, 2024 (“Plaintiff’s Class Certification Motion”), p. 9. Though it is unclear whether the quoted proposed class definition includes investors who sold put options, for the purpose of this report, I assume sellers of put options are included in the proposed class.

⁷ Cain Report, ¶ 1; Plaintiff’s Class Certification Motion, footnote 1. Plaintiff and Dr. Cain have included seven senior notes issued by subsidiaries of Credit Suisse with the following CUSIPs: 22541LAE3, 225433AC5, 225433AF8, 22550L2E0, 22550L2G5, 22550L2K6, and 22550L2M2. See Cain Report, ¶¶ 114–120. Dr. Cain states in his report that the Credit Suisse Options were exchange traded. See Cain Report, ¶ 104 (“Credit Suisse Options benefitted from significant trading opportunities on a national, liquid options exchange – the CBOE – during the Class Period.”).

30. I understand that Plaintiff alleges that alleged misrepresentations made during the Proposed Class Period caused artificial inflation in the prices of the Credit Suisse Securities (“artificial inflation”) and resulted in losses through a set of alleged corrective disclosures and/or materializations of risks allegedly concealed by the alleged misrepresentations (together the alleged “revelatory events”). Dr. Cain describes the allegations as “Defendants … concealed substantial customer and/or asset outflows as well as material weaknesses in the Company’s internal controls over financial reporting and misrepresented the Company’s then-existing financial condition.”⁸

31. Dr. Cain states that “[t]he relevant truth was allegedly revealed through three revelatory disclosures on February 9, 2023, March 14, 2023, and March 20, 2023.”⁹ He further states that he understands these represent “the three revelatory events through which Lead Plaintiff intends to prove the artificial inflation in the Credit Suisse Securities dissipated.”¹⁰ I have been instructed by Counsel, however, to focus on the alleged “revelatory events” on March 14, 2023 and March 20, 2023, based on the understanding that the Court’s Decision and Order Disposing of Pending Motion to Dismiss (“MTD Order”) has explicitly ruled out February 9, 2023 as a corrective disclosure.¹¹

32. Specifically, with respect to March 14, 2023, Plaintiff alleges that:

⁸ Cain Report, ¶ 17.

⁹ Cain Report, ¶ 18. Dr. Cain states “[he] understand[s] that February 9, 2023, March 14, 2023, and March 20, 2023 are the three revelatory events through which Lead Plaintiff intends to prove the artificial inflation in the Credit Suisse Securities dissipated.” See Cain Report, footnote 20.

¹⁰ Cain Report, ¶ 18, footnote 20.

¹¹ Decision and Order Disposing of Pending Motion to Dismiss, *Ali Diabat v. Credit Suisse Group AG et al.*, Case No. 1:23-cv-05874-CM, September 19, 2024 (“MTD Order”), pp. 273–274 (“The February 9, 2023 Earnings Release, identified by Plaintiff as a ‘corrective disclosure,’ is yet another disclosure that he also alleged contained false and/or misleading language … However, when attempting to explain why the statements in the earnings release were false and/or misleading, Plaintiff alleges that the Company misrepresented and failed to disclose that ‘the Company was experiencing significant and unusual customer and/or asset outflows that had not ‘stabilized.’’ [] Again, Plaintiff cannot have it both ways – the same disclosure cannot at one and the same time be both false/misleading and corrective … Moreover, I have already concluded that none of the Company’s statements dealing with the amount of its losses, the amount of customer outflows, or the fact that assets under management were decreasing was false when made. The facts were out there; the Company’s failure to characterize those facts using the loaded adjectives that Plaintiff prefers does not add anything to what the market already knew. There was simply nothing that any disclosure could correct. The one set of statements that I agree qualifies as ‘corrective’ is the statements made in connection with the [March 14, 2023] release of the 2022 Annual Report.”).

[O]n March 14, 2023, Credit Suisse issued its 2022 Annual Report and stunned the market by revealing that it had “identified material weaknesses in our internal control over financial reporting as of December 31, 2022 and 2021.” … The media reported on this revelation and quoted extensively from the Annual Report, ultimately attributing Credit Suisse’s downfall, in part, to the announcement of the material weaknesses in ICFR.¹²

I understand that the Court has held that Plaintiff “had sufficiently alleged that the March 14 public filing of the 2022 Annual Report constituted a corrective disclosure and a materialization of a concealed risk.”¹³

33. With respect to March 20, 2023, Plaintiff alleges that “on Sunday, March 19, 2023, Credit Suisse suddenly announced it would no longer operate as an independent entity, and, at the behest of the Swiss government, would be acquired by its former rival, UBS Group AG [(‘UBS’)], for less than half of its last traded market value on March 17, 2023.”¹⁴ I understand that the Court has held that “[t]he merger announcement … does not correct any prior misrepresentation – it simply announces that the Bank is going to merge,”¹⁵ but that it could arguably represent “the ultimate materialization of the risk.”¹⁶

¹² Plaintiff’s Class Certification Motion, p. 3. Plaintiffs also allege that Credit Suisse made alleged misrepresentations on this day: “[W]hile part of the truth about the dire situation at Credit Suisse was revealed to the market, Defendants also made a number of materially false and misleading statements therein in order to make it appear as if Credit Suisse’s financial condition was in much better shape than it actually was, including that its liquidity profile was maintained at ‘a sufficient level’ and that it was ‘developing a remediation plan to address the material weaknesses’ that had been disclosed.” In response to this disclosure, Plaintiffs state that “while the price of CS Securities fell on the disclosure of the ICFR weaknesses, because of these materially misleading statements, the stock price avoided total collapse and was able to recover some ground to close at \$2.51 per ADS on March 14, 2023 (albeit, a new all-time low).” *See Plaintiff’s Class Certification Motion*, pp. 3–4.

¹³ Decision and Order Denying Motion to Replace Lead Plaintiff, *Ali Diabat v. Credit Suisse Group AG et al.*, Case No. 1:23-cv-05874-CM, October 24, 2024 (“Lead Plaintiff Order”), p. 5.

¹⁴ Plaintiff’s Class Certification Motion, p. 4.

¹⁵ MTD Order, p. 276.

¹⁶ Lead Plaintiff Order, p. 5.

V. Background

A. Credit Suisse

34. Credit Suisse was a Swiss-based global financial services company that merged with UBS, another Swiss-based global financial services company, in 2023.¹⁷ At the time of its merger with UBS in 2023, Credit Suisse was the second largest Swiss financial services firm after UBS as measured by total assets.¹⁸ Credit Suisse (i.e., “Credit Suisse Group AG” or the “Company”) was the parent of Credit Suisse AG (the “Bank”), the Company’s banking business.¹⁹

35. The Credit Suisse ADSs traded on the New York Stock Exchange (“NYSE”) under the ticker “CS,” and the Company’s ordinary shares traded under the symbol “CSGN” on the SIX Swiss Exchange.²⁰ During the Proposed Class Period, the firm was reorganized from four to five global divisions: Wealth Management, Investment Bank, Swiss Bank, Asset Management, and Capital Release Unit.²¹

36. On Sunday, March 19, 2023, during the weekend following the last day of the Proposed Class Period, the Company announced its merger with UBS. In the merger, Credit Suisse shareholders received one share of UBS for every 22.48 shares of Credit Suisse they held.²² On Monday, March 20, 2023, the first trading day after the merger announcement, the Company’s ADS price closed at \$0.94, down 53.3% from the day before.²³

¹⁷ UBS, “UBS to Acquire Credit Suisse,” March 19, 2023, available at <https://www.ubs.com/global/en/media/display-page-ndp/en-20230319-tree.html>.

¹⁸ Jones, Sam, “A Very Swiss Identity Crisis,” *Financial Times*, March 24, 2023, available at <https://www.ft.com/content/e74c0556-5e60-4ab2-9876-7ac687b1d021>; Mones, Deza, and Rahan Ahmad, “Europe’s 50 Largest Banks by Assets, 2022,” *S&P Global Market Intelligence*, April 13, 2022, available at <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/europe-s-50-largest-banks-by-assets-2022-69689461>.

¹⁹ Credit Suisse Group AG, Form 20-F, March 10, 2022, Annual Report, 2021 (“2021 Annual Report”), p. 188.

²⁰ 2021 Annual Report, p. 188, Appendix p. 10.

²¹ 2021 Annual Report, p. 10; Credit Suisse Group AG, Form 20-F, March 14, 2023, Annual Report, 2022 (“2022 Annual Report”), p. 12. Effective January 1, 2023, Credit Suisse added the Capital Release Unit as a reporting segment.

²² UBS, “UBS to Acquire Credit Suisse,” March 19, 2023, available at <https://www.ubs.com/global/en/media/display-page-ndp/en-20230319-tree.html>.

²³ CRSP.

37. I have included as **Exhibit 2** a chart of Credit Suisse's ADS price annotated to show selected events. From October 26, 2022, the day before the Proposed Class Period to March 20, 2023, the first trading day after the Proposed Class Period, the Company's ADS price declined by approximately 80%.²⁴

38. Before and during the Proposed Class Period, the Company faced a number of business challenges. They included a series of losses, most notably due to the Archegos and Greensill failures in 2021, supervisory enforcement actions, rating downgrades, and a difficult market environment driven by geopolitical events and worsening macroeconomic conditions.

Specifically, these include:

- a. On March 5, 2021, Credit Suisse announced the closing of four Credit Suisse Supply Chain Finance funds managed in collaboration with Greensill Capital at short notice.²⁵ Credit Suisse's clients had around \$10 billion invested in the funds at the time of the closure.²⁶ Credit Suisse's clients were exposed to heavy losses from these funds.²⁷
- b. Three weeks later, on March 29, 2021, Credit Suisse announced that it lost a "highly significant" amount when the U.S. family office Archegos Capital Management, a hedge fund counterparty, defaulted.²⁸ The total losses to Credit Suisse were later disclosed as approximately CHF 5 billion.²⁹

²⁴ CRSP.

²⁵ Credit Suisse, "Credit Suisse Asset Management Winds Down Its Supply Chain Finance Funds," March 5, 2021, available at <https://am.credit-suisse.com/fr/fr/asset-management/about-asset-management/2021/cs-asset-management-winds-down-its-supply-chain-finance-funds.html>; 2021 Annual Report, p. 65.

²⁶ Morris, Stephen, "Credit Suisse Pulls Plug on \$10bn of Frozen Greensill-Linked Funds," *Financial Times*, March 5, 2021, available at <https://www.ft.com/content/ea3e45f8-2e58-4122-b3d7-265ab938b0d7>.

²⁷ 2022 Annual Report, p. 41; Walker, Owen, and Robert Smith, "Credit Suisse Breached Supervisory Law Over \$10bn Greensill Funds," *Financial Times*, February 27, 2023, available at <https://www.ft.com/content/90e1ddae-5ea6-4a88-8f8e-bf10cb3207fc>.

²⁸ Credit Suisse Group AG, Form 6-K, March 29, 2021, Press Release, "Trading Update," March 29, 2021, p. 1.

²⁹ Credit Suisse Group AG, Form 6-K, July 29, 2021, Financial Report, 2Q21 ("Q2 2021 Financial Report"), "Explanatory Note," p. 4 ("The 6M21 results included a loss of CHF 5,024 million in respect of the failure by a US-based hedge fund, Archegos Capital Management (Archegos), to meet its margin commitments, consisting of CHF 493 million of trading losses as a result of market movements during the process of closing out the fund positions, a provision for credit losses of CHF 4,500 million and operating expenses of CHF 31 million mainly relating to severance-related costs and professional services fees.").

- c. On July 27, 2022, after reporting net losses in consecutive quarters, Credit Suisse announced the replacement of its CEO.³⁰ The Company also stated that it would conduct a comprehensive strategic review, which would include a review of its cost base and potentially further shrinking of its investment bank.³¹
- d. At the beginning of August 2022, Moody's and Fitch downgraded both the Company and the Bank's rating. Specifically, on August 1, 2022, Moody's downgraded the Company's rating to Baa2 and the Bank's rating to A2.³² On August 4, 2022, Fitch downgraded the Company's rating to BBB and the Bank's rating to BBB+.³³
- e. On October 1, 2022, rumors that an international investment bank was facing trouble began circulating on the platform then known as Twitter (currently X).³⁴ These rumors were tied by market commentators to Credit Suisse.³⁵ Credit Suisse later stated that “[d]uring the first two weeks of October 2022, following negative press and social media coverage based on incorrect rumors, Credit Suisse

³⁰ Credit Suisse Group AG, Form 6-K, July 27, 2022, Press Release, “Credit Suisse Appoints Ulrich Körner New Group Chief Executive Officer; Announces Comprehensive Strategic Review,” July 27, 2022, p. 1.

³¹ Credit Suisse Group AG, Form 6-K, July 27, 2022, Press Release, “Credit Suisse Appoints Ulrich Körner New Group Chief Executive Officer; Announces Comprehensive Strategic Review,” July 27, 2022, p. 1.

³² Moody's, “Moody's Downgrades Credit Suisse Group AG's Senior Unsecured Debt Ratings to Baa2; Outlook Negative,” August 1, 2022, available at https://www.moodys.com/research/Moodys-downgrades-Credit-Suisse-Group-AGs-senior-unsecured-debt-ratings-Rating-Action--PR_468210.

³³ Fitch Ratings, “Fitch Downgrades Credit Suisse Group to ‘BBB’; Outlook Negative,” August 4, 2022, available at <https://www.fitchratings.com/research/banks/fitch-downgrades-credit-suisse-group-to-bbb-outlook-negative-04-08-2022>.

³⁴ McCabe, Caitlin, “How a Social-Media Frenzy Around Credit Suisse Rattled Its Stock,” *The Wall Street Journal*, October 5, 2022, available at <https://www.wsj.com/articles/how-a-social-media-frenzy-around-credit-suisse-rattled-its-stock-11664978035>.

³⁵ De Gruyter, Caroline, “Social Media Is Now a Financial WMD,” *Foreign Policy*, May 1, 2023, available at <https://foreignpolicy.com/2023/05/01/social-media-banks-bank-run-credit-suisse-silicon-valley-first-republic/> (“On Oct. 1, 2022, a Saturday, Australian ABC business reporter David Taylor tweeted that sources had told him a major investment bank was ‘on the brink.’ He did not mention the bank’s name. The tweet went viral, soon appearing on Reddit, on which the ‘Wallstreetbets’ forum has 13.9 million followers. Next, rumors began to circulate that the bank in question could be Credit Suisse, the second-largest bank in Switzerland.”).

experienced significantly higher withdrawals of cash deposits as well as non-renewal of maturing time deposits.”³⁶

- f. On October 27, 2022, the first day of the Proposed Class Period, Credit Suisse reported its Q3 2022 Earnings.³⁷ The Company presented a net loss of approximately CHF 4 billion for the third quarter of 2022.³⁸ Credit Suisse also announced a capital increase of CHF 4 billion.³⁹ As part of this capital increase, the Saudi National Bank would acquire a shareholding of 9.9%.⁴⁰
- g. In November 2022, Credit Suisse faced further rating downgrades. On November 1, 2022, S&P downgraded the Company to BBB- and the Bank to A/A-2.⁴¹ On the same day, Moody’s affirmed its rating for the Company, but downgraded the Bank to A3/Prime-2.⁴²
- h. On November 23, 2022, Credit Suisse issued a press release reporting that as of November 11, 2022, net outflows for the Company were around 6% of assets under management (“AUM”) at the end of the third quarter of 2022.⁴³
- i. Credit Suisse published its full-year 2022 results on February 9, 2023 and announced a net loss of CHF 7.3 billion for 2022, that the Company attributed to

³⁶ Credit Suisse Group AG, Form 6-K, October 27, 2022, Earnings Release, 3Q22 (“Q3 2022 Earnings Release”), p. 5.

³⁷ Q3 2022 Earnings Release.

³⁸ Q3 2022 Earnings Release, p. 2. *See also* Credit Suisse Group AG, Form 6-K, November 2, 2022, Financial Report, 3Q22 (“Q3 2022 Financial Report”), p. 6.

³⁹ Credit Suisse Group AG, Form 6-K, October 27, 2022, Press Release, “The Board of Directors of Credit Suisse Group AG Proposes Two Share Capital Increases to Further Strengthen the Group’s Capital Base and Support Its New Strategic Direction,” October 27, 2022, p. 1.

⁴⁰ Credit Suisse Group AG, Form 6-K, October 27, 2022, Press Release, “The Board of Directors of Credit Suisse Group AG Proposes Two Share Capital Increases to Further Strengthen the Group’s Capital Base and Support Its New Strategic Direction,” October 27, 2022, p. 1; Credit Suisse Group AG, Form 6-K, November 25, 2022, Press Release, “Credit Suisse Group AG Executes Capital Increase by Way of Share Placement and Announces the Final Terms of the Rights Offering,” November 24, 2022, p. 1.

⁴¹ S&P Global, “Credit Suisse AG Downgraded to ‘A-/A-2’ on Execution and Franchise Risks Under Restructuring Plan; Outlook Stable,” November 1, 2022, available at <https://disclosure.spglobal.com/ratings/es/regulatory/article/-/view/type/HTML/id/2910979>.

⁴² Moody’s, “Moody’s Affirms Credit Suisse Group’s AG Senior Unsecured Debt at Baa2 and Downgrades Credit Suisse AG’s Senior Unsecured Debt to A3 and Deposits to A3/Prime-2; Outlook Negative,” November 1, 2022, available at https://www.moodys.com/research/Moodys-affirms-Credit-Suisse-Groups-AG-senior-unsecured-debt-at-Rating-Action--PR_470331.

⁴³ Credit Suisse Group AG, Form 6-K, November 23, 2022, Press Release, “Credit Suisse Provides Market with Updated Outlook for the Fourth Quarter of 2022,” November 23, 2022, p. 1.

a “challenging economic and market environment” and “significant deposit and net asset outflows at the beginning of the quarter.”⁴⁴ Specifically, Credit Suisse reported net asset outflows for the year totaling CHF 123 billion, with CHF 111 billion occurring in Q4 2022.⁴⁵

39. During the Proposed Class Period, the Company experienced outflows of assets under management and customer deposits. I have included as **Exhibit 3** the quarterly changes in assets under management and deposits for Credit Suisse. As shown in this exhibit, the Company’s overall AUM declined from CHF 1,401 billion in Q3 2022, the quarter before the Proposed Class Period, to CHF 1,253 billion in Q1 2023, the quarter containing the end of the Proposed Class Period.

B. Banking Crisis in Early 2023

40. Credit Suisse’s stock price decline at the end of the Proposed Class Period and its regulator-facilitated merger with UBS occurred in the context of a broader banking crisis in early 2023, that while originating among regional banks in the United States, affected European banks and banks in other jurisdictions as the crisis progressed.

41. As characterized by the Bank for International Settlement in a “Report on the 2023 Banking Turmoil”:

The banking turmoil that started in March 2023 is the most significant system-wide banking stress since the Great Financial Crisis (GFC) in terms of scale and scope. The bank failures, while having largely distinct causes, triggered a broader crisis of confidence in the resilience of banks, banking system and financial markets across multiple jurisdictions. In response, wide scale public support measures were deployed by some jurisdictions to mitigate the impact of the stress.⁴⁶

42. Market commentators and academic studies attribute the 2023 banking crisis at least partly to rapidly changing macroeconomic conditions in 2022 and early 2023, including high

⁴⁴ Credit Suisse Group AG, Form 6-K, February 9, 2023, Press Release, “Credit Suisse Makes Strong Progress on Group Strategic Priorities; Reports Net Revenues of CHF 3.1 bn and Pre-Tax Loss of CHF 1.3 bn Along with a CET1 Ratio of 14.1% in 4Q22,” February 9, 2023, p. 3. *See also* Credit Suisse Group AG, Form 6-K, February 9, 2023, Earnings Release, 4Q22 (“Q4 2022 Earnings Release”), p. 2.

⁴⁵ Credit Suisse Group AG, Form 6-K, February 9, 2023, Press Release, “Credit Suisse Makes Strong Progress on Group Strategic Priorities; Reports Net Revenues of CHF 3.1 bn and Pre-Tax Loss of CHF 1.3 bn Along with a CET1 Ratio of 14.1% in 4Q22,” February 9, 2023, p. 3.

⁴⁶ “Report on the 2023 Banking Turmoil,” *Bank for International Settlements*, October 2023, available at <https://www.bis.org/bcbs/publ/d555.htm> (“BIS Report”), p. 1.

inflation and rising interest rates.⁴⁷ **Exhibit 4** contains a chart of short-term interest rates, longer-term interest rates, and inflation in the U.S. from June 2020–June 2023. **Exhibit 5** shows the same information for the Euro-area. Increased interest rates led to the decline in the value of many assets held by banks. Specifically, increased interest rates decreased the value of fixed-rate loans and securities held by banks.

43. The Group of Thirty (“G30”) reflecting on the 2023 banking crisis further comments that:

Events in March 2023 shook up the banking systems in the United States and Europe. Risky funding structures, large unrealized losses, and declining profit margins at several US banks, and one large Swiss bank, triggered rapid deposit runs that precipitated the banks’ failures. The failures were triggered by a combination of poor business models, weak risk management, and a rapidly shifting macroeconomic environment.⁴⁸

44. The banking crisis in early 2023 included the failures of several U.S. regional banks, such as Silicon Valley Bank (March 10, 2023), Signature Bank (March 12, 2023), and First Republic Bank (May 1, 2023).⁴⁹ These three events represented three of the four largest bank failures in U.S. history.⁵⁰ During the banking crisis, the stock price volatility of banks increased. For

⁴⁷ See, e.g., Angeloni, Ignazio, et al., “Much Money, Little Capital, and Few Reforms: The 2023 Banking Turmoil,” *Geneva Reports on the World Economy* 27, 2024, available at https://cepr.org/system/files/publication-files/212212-geneva_27_much_money_little_capital_and_few_reforms_the_2023_banking_turmoil.pdf, p. 7 (“The events in the United States and Europe had several common causes, an important one of which was a rapidly changing macroeconomic environment”); BIS Report, p. 5 (“Following this period of highly accommodative monetary policy in many jurisdictions, 2022 saw the start of the most synchronised and intense monetary policy tightening on recent record [] in an effort to curb high inflation … Against this backdrop, the increase in interest rates and quantitative tightening by some central banks resulted in a worsening of financial conditions … [T]he rising rate environment also saw a sharp reduction in the value of long-duration fixed interest assets.”). See also “Financial Stability Report,” *Board of Governors of the Federal Reserve System*, May 2023, available at <https://www.federalreserve.gov/publications/files/financial-stability-report-20230508.pdf> (“Financial Stability Report”). Box 5.1 shows that persistent inflation and monetary tightening were cited as top risks to financial stability.

⁴⁸ The Group of Thirty, “G30 Report, Bank Failure and Contagion: Lender of Last Resort, Liquidity, and Risk Management, Proposes Fixes to the Banking System to Enhance Resilience,” January 9, 2024, available at <https://www.prweb.com/releases/g30-report-bank-failures-and-contagion-lender-of-last-resort-liquidity-and-risk-management-proposes-fixes-to-the-banking-system-to-enhance-resilience-302030102.html>.

⁴⁹ Financial Stability Report, pp. 1, 33.

⁵⁰ “Bank Failures in Brief – Summary,” *Federal Deposit Insurance Corporation*, available at <https://www.fdic.gov/resources/resolutions/bank-failures/in-brief/index>.

example, **Exhibit 6** and **Exhibit 7** show the implied volatility of the constituents of the KBW Bank Index and selected European banks with U.S. ADRs⁵¹ before and after the failure of Silicon Valley Bank. Implied volatility is a metric for expected volatility of a stock that is implied from the price of traded options on that stock based on an options pricing model.⁵²

45. Similarly, **Exhibit 8** shows the average standard deviation of daily returns for constituents of the KBW Bank Index and selected European banks with U.S. ADRs before and after the failure of Silicon Valley Bank. As shown in the exhibit, the average standard deviation of returns for banks increased after the failure of Silicon Valley Bank.

46. Additionally, the market's assessment of bank default risk increased during the banking crisis. The Credit Default Swap ("CDS") spread on a bond represents the cost of insuring against the bond's default and can therefore be used as a proxy for default risk.⁵³ **Exhibit 9** shows the median CDS spread on 5-year senior notes for constituents of the KBW Bank Index and selected European banks with U.S. ADRs⁵⁴ in March 2023. As shown in the exhibit, CDS spreads on bank stocks increased as the banking crisis progressed.

47. Moreover, while the banking crisis originated in the U.S., according to securities analysts and commentators, the regional banking crisis in the U.S. had a "contagion" effect in Europe and other jurisdictions. As a Bank for International Settlements report points out:

⁵¹ Selected banks include eight European banks with U.S. ADRs listed on a major exchange. These banks were identified as a "peer group" for return comparison purposes in Credit Suisse's 2022 Annual Report "based on similarities in geographical coverage and scope of business." *See* 2022 Annual Report, p. 250. The exhibit plots the median across banks of the "3 month 100% Moneyness Implied Volatility" series from *Bloomberg*. This series is provided by *Bloomberg* and calculated based on *Bloomberg*'s Listed Implied Volatility Engine ("LIVE"), which interpolates implied volatility for an at-the-money option with three months until expiration across both call and put options. *See* "Real-Time Volatilities," *Bloomberg*, available at https://data.bloombergglp.com/professional/sites/10/750114_Real-Time-Volatilities.pdf. As discussed in **Section VII** below, each option series has its own implied volatility that can differ substantially between option series.

⁵² Hull, John C., *Options, Futures, and Other Derivatives*, Eleventh Edition (New York, NY: Pearson, 2022) ("Hull (2022)"), p. 336 ("In practice, traders usually work with what are known as implied volatilities. These are the volatilities implied by option prices observed in the market.").

⁵³ Hull (2022), p. 566 ("The most popular credit derivative is a *credit default swap* (CDS) ... It is a contract that provides insurance against the risk of a default by a particular company.").

⁵⁴ Selected banks include eight European banks with U.S. ADRs listed on a major exchange. These banks were identified as a "peer group" for return comparison purposes in Credit Suisse's 2022 Annual Report "based on similarities in geographical coverage and scope of business." *See* 2022 Annual Report, p. 250.

As recent events have shown, however, the failure of a bank can have systemic implications through multiple channels, including first- and second- round propagation effects. For example, the distress of relatively small banks ... can trigger broader and cross-border systemic concerns and contagion effects.⁵⁵

48. As analysts from J.P. Morgan noted in a March 17, 2023 report:

What set this off? As mentioned, the sector as a whole had already begun to come under pressure on Friday on the back of developments in the US banking sector overnight; but, despite the considerable steps taken by authorities to prevent contagion risk and backstop sector liquidity ... sentiment appeared little changed on Monday. The market instead only doubled down on its bearishness towards global banks, shifting focus to European lenders as the 'next in line'. Despite both our (and the street's) insistence that read-across here was extremely low, the guidance here clearly was falling on deaf ears, with broader questions being raised as to the role that contagion could play in transferring risk to the European system in spite its strong liquidity and capital position.⁵⁶

49. Similarly, in a March 19, 2023 report, analysts from Citigroup noted:

While there are examples of other European banks that have muddled through with poor profitability for multiple years, a re-appraisal of counterparty and depositor behaviour across global banks in the wake of SVB's failure meant that CS was losing >SF10bn of deposits a day at the end of last week according to the FT (19 March), even after the SNB liquidity line was announced.⁵⁷

50. Further, in a March 14, 2023 report, analysts from Bank of America linked the failure of Silicon Valley Bank to "higher credit spreads":

We note significantly higher credit spreads since the failure of SVB on 10 March. Should these persist, these would likely challenge near-term earnings.⁵⁸

⁵⁵ BIS Report, p. 27.

⁵⁶ "The Financials Statement: Credit Suisse; Inco Earnings Come to a Close," J.P. Morgan, March 17, 2023.

⁵⁷ "European Banks: Credit Suisse/UBS: The Tie-Up Nobody Wanted & Sector-Wide Implications," Citigroup, March 19, 2023.

⁵⁸ "CEO Comments Supportive," Bank of America, March 14, 2023.

51. Included as **Exhibit 10** is a chart of the KBW Bank Index and an index of European Bank ADRs⁵⁹ during early 2023 annotated with selected events occurring during the early 2023 banking crisis.

VI. Dr. Cain Fails to Provide a Methodology That Would Reliably Calculate Damages for Credit Suisse ADSs in a Manner Consistent with Plaintiff's Theory of Liability

52. As explained in this section, the economic circumstances affecting Credit Suisse during the Proposed Class Period, occurring in the context of the 2023 global banking turmoil, are distinctive. This means that one may not be able to use a boilerplate approach to measure inflation and damages in a way that is consistent with the Plaintiff's theory of liability. As discussed below, Dr. Cain has not proposed a methodology that is tailored to this case, and thus his opinion that damages can be calculated in this matter consistent with Plaintiff's theory of liability is flawed and unreliable.

53. In **Section VI.A**, I first summarize the generic approach for calculating damages that Dr. Cain describes in his report. **Section VI.B** then provides additional background on one of the elements of Dr. Cain's proposed approach to measure artificial inflation, an event study.

54. In **Section VI.C**, I discuss why the generic descriptions provided by Dr. Cain fail to address the distinctive facts and circumstances at hand, and therefore fail to show how potential damages could be reliably calculated in a manner consistent with Plaintiff's theory of liability. Specifically, Dr. Cain fails to account for the unusual challenge Plaintiff's expert will face when attempting to measure artificial inflation using the price reaction to one of the alleged "revelatory events," the announcement of the Company's merger with UBS. This is because the event took place in the context of an extraordinary, regulator-facilitated merger amidst the 2023 banking crisis. I am not aware of any existing methodology from academic literature, nor has Dr. Cain offered any, that is capable of reliably modeling the changes in market expectations regarding a potential future regulator-facilitated merger arising from a "but-for" disclosure and hence the price impact of such a disclosure over time. In addition, Dr. Cain has further failed to articulate

⁵⁹ This European Bank ADR Index represents an equal-weighted index of eight European banks with U.S. ADRs listed on a major exchange. These banks were identified as a "peer group" for return comparison purposes in Credit Suisse's 2022 Annual Report "based on similarities in geographical coverage and scope of business." See 2022 Annual Report, p. 250.

a methodology that can handle the challenge of using an event that represents the materialization of risk as a measure of artificial inflation or to address other distinctive challenges to measuring artificial inflation throughout the Proposed Class Period.

55. Finally, in **Section VI.D**, as requested by Counsel, I separately discuss that Dr. Cain has failed to propose a methodology capable of estimating damages associated with the alleged misrepresentations regarding Credit Suisse’s ICFR.

A. Dr. Cain’s Proposed Damages Methodology for Credit Suisse ADSs

56. Rather than providing a damages methodology tailored to Plaintiff’s theory of liability, and the distinctive economic circumstances affecting Credit Suisse, Dr. Cain instead provides a generic description of how damages could be calculated for a securities fraud claim.

57. Specifically, Dr. Cain cites the “‘out-of-pocket’ method” as the “standard and well-accepted methodology for calculating damages under §10(b) of the Exchange Act.”⁶⁰ He states that “[t]his approach calculates investor damages formulaically as the artificial inflation in the share price at the time of an investor purchase minus the artificial inflation in the share price at the time of an investor sale.”⁶¹

58. He describes “the quantification of artificial inflation per share during the [Proposed] Class Period” as an “input” to the “formula” for calculating damages, and claims that this “input” is the product of a “detailed loss causation analysis,” which he has “not been asked to perform … at this time.”⁶² He states that “event studies are widely employed to calculate artificial inflation” and that “[e]vent studies measure security price reactions to events revealing the relevant truth that was concealed by alleged fraudulent misrepresentations and omissions.”⁶³

59. In the event of “confounding information,” that is “[t]o the extent that reliable evidence is introduced to show that a significant portion of the difference in the artificial inflation between the purchase and sale of the securities may be attributed to non-fraud related factors,” Dr. Cain suggests that the impact of such information can be identified using “event study analysis,

⁶⁰ Cain Report, ¶ 177.

⁶¹ Cain Report, ¶ 177. He also notes that “[i]f shares are not sold prior to the full revelation of the fraud, then the difference is relative to a 90-day lookback period under the Private Securities Litigation Reform Act of 1995 (‘PSLRA’).” Cain Report, ¶ 177.

⁶² Cain Report, ¶ 179.

⁶³ Cain Report, ¶ 179.

valuation analysis, analyst reports, principles of finance and valuation analysis, and peer-reviewed academic research.”⁶⁴

60. Dr. Cain claims that “loss causation analysis also documents how artificial inflation per share evolved throughout the [Proposed] Class Period.”⁶⁵ Dr. Cain mentions two different methods for “modeling the evolution of inflation,” (i) “constant dollar inflation” and (ii) “constant percentage inflation,”⁶⁶ and also references generic approaches that, according to him, could be used if “the true economic inflation was not constant over the [Proposed] Class Period.”⁶⁷ These generic approaches, according to Dr. Cain, “can involve valuation techniques, event studies, published academic research studies, analyst research, and/or other case-specific documents.”⁶⁸

61. Dr. Cain also includes a subsection in his report titled “Damage Methodologies are Flexible and Can Incorporate Alternative Findings of Fact.”⁶⁹ In this subsection, Dr. Cain claims that the methodologies he has proposed “can be modified based on specific findings the finder of fact may make” regarding “confounding information,” “how to back-cast inflation over the [Proposed] Class Period” and “when the first actionable fraudulent conduct or misstatement occurred.”⁷⁰ He does not, however, provide any detail on how damages should be measured as an economic matter.

62. For example, Dr. Cain states that “should the finder of fact determine that the true economic inflation was not constant over the [Proposed] Class Period, the out-of-pocket damages methodology can account for such a scenario.”⁷¹ He gives a “hypothetical example,” which assumes the “finder of fact concludes that for the first half of the [Proposed] Class Period, artificial inflation was 50% of the amount of artificial inflation present during the second half of the Class Period.”⁷² In this “hypothetical example,” however, Dr. Cain simply makes an

⁶⁴ Cain Report, ¶ 180.

⁶⁵ Cain Report, ¶ 181.

⁶⁶ Cain Report, ¶¶ 182–183.

⁶⁷ Cain Report, ¶ 184. *See also* Cain Report, ¶ 193.

⁶⁸ Cain Report, ¶ 184.

⁶⁹ Cain Report, Section VIII.B.

⁷⁰ Cain Report, ¶ 189.

⁷¹ Cain Report, ¶ 193.

⁷² Cain Report, ¶ 190.

assumption regarding alleged stock price inflation. Dr. Cain does not explain how he, or another expert retained by Plaintiff, could reliably calculate that percentage.

63. My understanding is that at the class certification stage, Plaintiff's expert needs to describe a methodology to calculate damages on a class-wide basis consistent with Plaintiff's theory of liability. Further, I understand that at this stage, Dr. Cain does not need to implement his methodology and calculate inflation for each day of the Proposed Class Period. Rather, my understanding is that Dr. Cain is required to describe a methodology that is capable of estimating inflation consistent with Plaintiff's theory of liability that addresses the unusual economic and other circumstances in this case. Dr. Cain has not done this.

B. Event Study Analysis

64. Dr. Cain's proposed generic damages methodology references the use of an event study analysis. He also conducts an event study analysis as part of his analysis of market efficiency for Credit Suisse ADSs and Credit Suisse Notes.⁷³ In this section, I provide background on this technique, which is used in both financial economics research and securities litigation.

65. An event study is a financial economics technique used by researchers to measure the impact of company-specific information on a security's price.⁷⁴ Importantly, although an event study can be used to remove market and industry effects from a security's price, an event study, by itself, is not capable of removing company-specific information unrelated to the event being studied. An event study is typically conducted as follows:

66. First, a researcher identifies events of interest, which the researcher will test to see whether they affected the security's price. For example, in securities litigation, a financial economist might consider the alleged corrective disclosures as events of interest. In addition to selecting events, a financial economist must also determine an event window, or the amount of

⁷³ Cain Report, ¶¶ 65, 153. While Dr. Cain suggests an event study as part of a damages methodology, Dr. Cain claims that the event study he presents in the Cain Report is "solely for the purpose of evaluating market efficiency" and the event study is "not intended to quantify artificial inflation or to assess loss causation." See Cain Report, footnotes 83, 240. Given that Dr. Cain has not prepared an event study to demonstrate that damages can be calculated, I refer to the regression model he uses for the purpose of analyzing market efficiency in my discussion regarding whether Dr. Cain has shown that damages can be calculated consistent with Plaintiff's theory of liability.

⁷⁴ See, e.g., MacKinlay, Craig A., "Event Studies in Economics and Finance," *Journal of Economic Literature*, Vol. 35, No. 1, 1997, pp. 13–39 ("MacKinlay (1997)"), at pp. 14–16.

time such events are expected to influence a security's price. When performing event studies on securities that trade in an efficient market, an event window is typically one trading day.⁷⁵ If multiple pieces of company-specific information are released during an event window, an event study is not capable of distinguishing between events, and therefore cannot isolate the company-specific price response to the specific events.

67. Second, a researcher performs a regression analysis to estimate the company-specific price response to the events being studied. Security prices are influenced by multiple factors including broad market factors, industry-specific factors, and company-specific factors. A regression analysis attempts to isolate security price changes caused by company-specific factors by removing the effect of market- and industry-specific factors.

68. To do so, a regression model measures the relationship between the security's returns and the returns of the market and industry the security belongs to over a specified period, known as a "control period" or "estimation period." This control period should be a reasonable representation of the testing period in terms of the (i) relationship between the security's returns and the returns of the market and industry and (ii) the level of volatility. Once the relationship has been established, a researcher can use the relationship to predict what the return of a security should be on a given day, absent any company-specific information, based on the returns of the market and industry on that day. A researcher can then estimate the company-specific return by subtracting the security's actual return from the predicted return. The company-specific return is also known as a residual return (or "abnormal" return).

69. Third, after a researcher has estimated the residual return on the event day, the researcher can then test the residual return for statistical significance. That is, the researcher can test whether a specific residual return is outside of the normal range of residual price movements, and thus whether there is evidence that company-specific information impacted the security's price. This is accomplished by comparing the size of the residual return to the standard error of that residual, which is calculated over the control period and represents a measure of typical residual price movements.

⁷⁵ Dr. Cain uses an event window of one day in the event study he performs to test for market efficiency. *See Cain Report*, ¶ 70. The use of a one-day window is consistent with academic literature suggesting that in an efficient market, stock prices rapidly incorporate new, value-relevant information. *See Section VI.D.2.*

70. More specifically, the “t-statistic” is calculated as the residual return divided by the standard error. The size of this “t-statistic” is then compared to a benchmark based on the relevant confidence level being tested.⁷⁶ If the absolute value of the t-statistic is greater than the benchmark, then the residual return is statistically significant.

71. When determining statistical significance, a 95% confidence level is typically used. That is, if a residual return is statistically significant at the 95% confidence level, it means that there is less than a 5% probability that the residual return on that day is truly zero but subject to random variation. The 95% confidence level is commonly used in academic work and is the typical standard used in the context of litigation.⁷⁷ In addition to being used in the social sciences, this level is also used in the natural sciences. Ross (2017) confirms that the “5 percent level of significance … has become the most common in practice.”⁷⁸ This is also the level that Dr. Cain uses in his analysis.⁷⁹

C. Dr. Cain Fails to Provide a Methodology That Is Capable of Addressing the Distinctive Circumstances of This Particular Matter

72. As Dr. Cain notes in his report, an assessment of damages requires an assessment of artificial inflation in the Credit Suisse Securities throughout the Proposed Class Period.⁸⁰ I understand that artificial inflation represents the difference between the price of a security in the “actual” world as compared to a “but-for” scenario, that is, the price of a security absent the alleged misrepresentations. The level of artificial inflation is thus tied to both a “but-for” disclosure, that is, what the Company allegedly could and should have said at earlier points in the Proposed Class Period, and the security price impact of such a “but-for” disclosure. As discussed above, in his report, Dr. Cain describes the use of an event study and “constant dollar” or “constant percentage” inflation, among other generic approaches for estimating artificial

⁷⁶ For a large sample size, a 95% confidence level, and a two-tailed test, the appropriate benchmark level is 1.96.

⁷⁷ Kaye, David H., and David A. Freedman, “Reference Guide on Statistics,” in *Reference Manual on Scientific Evidence*, Federal Judicial Center et al. eds., Third Edition (Washington, D.C.: The National Academies Press, 2011), pp. 211–302 (“Kaye and Freedman (2011)”), at pp. 251–252.

⁷⁸ Ross, Sheldon M., *Introductory Statistics*, Fourth Edition (Amsterdam, NL: Academic Press, 2017), p. 425.

⁷⁹ Cain Report, ¶ 79.

⁸⁰ Cain Report, ¶ 179 (“Another input to the above formula, the quantification of artificial inflation per share during the Class Period, is based upon a detailed loss causation analysis.”).

inflation.⁸¹ It is my understanding that these approaches assume that a hypothetical earlier “but-for” disclosure has the same security price impact at an earlier point in the Proposed Class Period (on either a “dollar” or “percentage” basis) as a later alleged corrective disclosure. Dr. Cain has not shown that such an assumption applies in this matter.

73. As discussed in this section, there are distinctive circumstances that are applicable to the matter at hand that Dr. Cain does not address. Among other issues, there are distinctive challenges that Dr. Cain or another expert retained by Plaintiff will face when measuring artificial inflation using the price reaction to an extraordinary, regulator-facilitated merger, which occurred in the context of a banking crisis. As discussed in the next section (**Section VI.D**), there are also additional specific issues with respect to the alleged misrepresentations relating to the Company’s ICFR that Dr. Cain has not addressed.

1. Dr. Cain Fails to Describe a Damages Methodology That Can Reliably Calculate Inflation Using the Price Drop Following an Extraordinary Event, a Regulator-Facilitated Merger, During a Banking Crisis

74. An important and distinctive attribute of the matter at hand is that the price movement following the March 19, 2023 disclosure of Credit Suisse’s merger with UBS represents the market’s reaction to the announcement of an extraordinary event, a regulator-facilitated merger, amidst the 2023 banking crisis. As described in this section, Dr. Cain fails to describe a damages methodology that can calculate inflation that is consistent with Plaintiff’s theory of liability using the price drop following such an event.

75. On Sunday, March 19, 2023, Credit Suisse announced that the Company was merging with UBS.⁸² The following day, Monday, March 20, 2023, Credit Suisse’s stock price declined on a residual basis by 53.3% based on Dr. Cain’s event study model.⁸³ In the merger, Credit Suisse shareholders received one share of UBS for every 22.48 shares of Credit Suisse they

⁸¹ Cain Report, ¶¶ 182–183. Dr. Cain also references generic approaches that according to him could be used if “the true economic inflation was not constant over the [Proposed] Class Period.” See Cain Report, ¶¶ 184, 193. Dr. Cain’s references to these other generic approaches do not demonstrate that he could calculate damages in this matter given the distinctive economic circumstances discussed in this report.

⁸² Credit Suisse Group AG, Form 6-K, March 20, 2023, Press Release, “Credit Suisse and UBS to Merge,” March 19, 2023, p. 1.

⁸³ Cain Report Production, “OUTPUT CS Event Study.xlsx,” tab “ret_SPTR_peer_equ_wt.”

held.⁸⁴ As discussed below, the press and regulatory filings I have reviewed indicate that the merger was facilitated by Swiss regulators.

76. Specifically, on the afternoon of March 15, 2023, representatives of the Swiss Government, the Swiss National Bank (“SNB”), and the Swiss Financial Market Supervisory Authority (“FINMA”) approached UBS about a possible merger with Credit Suisse.⁸⁵ That day, Credit Suisse’s ADS price had declined following statements made by the Saudi National Bank regarding its involvement in Credit Suisse (by 6.6% on a residual basis based on Dr. Cain’s model).⁸⁶ The Swiss regulators communicated to UBS that “of all possible options available to give the market necessary reassurance, the one deemed by Government Representatives to be the most successful in reassuring markets and minimizing negative fallout was an orderly takeover of Credit Suisse by UBS.”⁸⁷

77. Following this meeting, the regulators met with both Credit Suisse and UBS multiple times between March 15, 2023 and the announcement of the merger on March 19, 2023, in order to negotiate the terms of the merger.⁸⁸ The regulators helped facilitate the merger of Credit Suisse and UBS through government assistance.⁸⁹ For example, the assistance included

⁸⁴ UBS Group AG, Form F-4/A, June 9, 2023, p. 6.

⁸⁵ UBS Group AG, Form F-4/A, June 9, 2023, p. 44 (“On the afternoon of March 15, 2023, representatives of the Swiss Government, SNB and FINMA (‘Government Representatives’) met with the Chairman of the UBS Group AG board of directors and other representatives of UBS Group AG. The Government Representatives outlined the heightened fragility of the financial system following the failure of Silicon Valley Bank in the United States and the need to avoid contagion by taking decisive action with respect to Credit Suisse in order to safeguard the domestic and international financial stability by the end of the weekend. Government Representatives indicated that of all possible options available to give the market necessary reassurance, the one deemed by Government Representatives to be most successful in reassuring markets and minimizing negative fallout was an orderly takeover of Credit Suisse by UBS Group AG on a going concern basis. UBS Group AG was therefore asked whether it was willing to consider merging with Credit Suisse in principle.”).

⁸⁶ Cain Report Production, “OUTPUT CS Event Study.xlsx,” tab “ret_SPTR_peer_equ_wt”; Illien, Noele, “Credit Suisse Stock Slump Triggers Close Monitoring by Regulators,” *Reuters*, March 15, 2023, available at <https://www.reuters.com/business/finance/credit-suisse-shares-drop-fresh-record-low-cds-widen-2023-03-15/>.

⁸⁷ UBS Group AG Form F-4/A, June 9, 2023, p. 44.

⁸⁸ UBS Group AG Form F-4/A, June 9, 2023, pp. 44–46.

⁸⁹ See, e.g., UBS Group AG Form F-4/A, June 9, 2023, p. 46 (“On the afternoon of March 19, 2023, after having considered the circumstances described above and having determined that the merger was in the best interests of their shareholders and other stakeholders as compared to other available alternatives, the UBS Group AG board of directors approved the merger. In making its determination, the board considered the liquidity facilities made available to both banks, the additional loss buffer created by the FINMA-ordered write-down of Credit Suisse AT1 instruments, the Loss Protection Agreement authorized

government-provided liquidity facilities, a government guarantee to cover certain losses, and provisional approval of the transaction by FINMA instead of competition authorities.⁹⁰

78. As mentioned above, my review of the BIS report and regulatory filings suggests that the merger was facilitated by the Swiss government with the aim to stem the contagion effect and to prevent further erosion of the public confidence of the banking system, given the rapidly unfolding 2023 banking turmoil.⁹¹ In order to draw reliable economic inference from the stock price reactions to this event, one would need to account for this important market context.

79. Dr. Cain, however, has not addressed these distinctive circumstances. He has not explained how he could use the March 20, 2023 Credit Suisse ADS price decline, which followed the March 19, 2023 merger announcement, as a measure of artificial inflation earlier in the Proposed Class Period, when that decline followed an extraordinary event, a regulator-facilitated merger occurring in a highly unusual market environment.

80. As an initial matter, Dr. Cain has not explained to what extent a hypothetical “but-for” disclosure at an earlier point during the Proposed Class Period from Credit Suisse would result in the market expecting a regulator-facilitated merger on the same or similar terms, when the earlier

by the revised Special Ordinance and the expressions of support for the transaction from key regulators of both UBS Group AG and Credit Suisse.”).

⁹⁰ BIS Report, pp. 14–15 (“On 16 and 19 March 2023, in strict alignment and coordination with SNB and FINMA, the Swiss Federal Council adopted emergency measures aimed at ensuring the viability of CS and ultimately paving the way for a takeover by UBS. These emergency measures were established to protect financial stability (at national and international level) and the Swiss economy: First, the Swiss Federal Council introduced rules allowing SNB to provide additional emergency liquidity (so-called ELA+) up to CHF 100bn in total to CS and UBS by granting a privileged hierarchy to ELA+ credits in case of bankruptcy. Second, a public liquidity backstop was enacted which made it possible for SNB to provide an additional CHF 100bn in liquidity to CS secured by a public guarantee issued by the Swiss Confederation. Third, the Swiss Confederation provided a public guarantee to UBS for CHF 9bn on losses that might materialise in reference to specific assets on CS’s balance sheet which UBS intends to exit in the course of the integration process and for which UBS agreed to take a first CHF 5bn loss post takeover ... The AT1 instruments issued by CS contractually state that they will be completely written down in a ‘Viability Event’, in particular if extraordinary government support is granted or when FINMA orders this to avoid insolvency. Since CS was granted extraordinary liquidity assistance loans secured by a federal default guarantee on 19 March 2023 to avoid its insolvency, these contractual conditions were met for the AT1 instruments issued by the bank. ... Finally, FINMA gave its provisional approval to the takeover of CS in lieu of the Swiss Competition Commission.”).

⁹¹ See, e.g., BIS Report, p. 14 (“On 16 and 19 March 2023, in strict alignment and coordination with SNB and FINMA, the Swiss Federal Council adopted emergency measures aimed at ensuring the viability of CS and ultimately paving the way for a takeover by UBS. These emergency measures were established to protect financial stability (at national and international level[s]) and the Swiss economy.”).

hypothetical disclosure would be made in the environment without analogous concerns regarding a global banking crisis.

81. Moreover, Dr. Cain has also not shown how he would be able to estimate the price impact of an earlier “but-for” disclosure made by Credit Suisse at the beginning of the Proposed Class Period, had that disclosure been different from the March 19, 2023 disclosure, that is, in the absence of a regulator-facilitated merger. This is a particular challenge for the reasons I discuss below.

82. First, Dr. Cain has not shown why it would be reasonable to assume that the support offered by Swiss regulators would have been similar, let alone the same, at earlier points in the Proposed Class Period, given that the regulatory assistance transpired in the specific context of the then ongoing 2023 banking crisis. As discussed above in **Section V.B**, after the failure of Silicon Valley Bank, the volatility of bank stock prices increased meaningfully. Moreover, as discussed above, the failure of U.S. regional banks had a “contagion” effect for European banks, leading to loss of public confidence in banks that may be perceived as “weaker” and susceptible to greater “bank run” risk.⁹² Dr. Cain has not shown that had Credit Suisse made certain “but-for” disclosures at an earlier point in time, the market would have expected that a similar action would have occurred in the absence of the failure of Silicon Valley Bank and other market-wide events, such as the rapidly changing macroeconomic environment that led to the 2023 banking crisis. From an economic perspective, Dr. Cain fails to explain how one could reliably model the government involvement that would have been expected in the absence of an ongoing banking crisis.

83. Second, aside from Credit Suisse’s own evolving profitability and liquidity conditions, Dr. Cain has also not addressed that regulators may have viewed Credit Suisse differently earlier in the Proposed Class Period for political, policy, or other reasons, and thus may have responded differently to a potential alternative disclosure by the Company. As an example, a Bank of America analyst referenced a series of supportive statements from Swiss regulators in a January 9, 2023 analyst report:⁹³

⁹² See, e.g., “The Financials Statement: Credit Suisse; Inco Earnings Come to a Close,” J.P. Morgan, March 17, 2023; “European Banks: Credit Suisse/UBS: The Tie-Up Nobody Wanted & Sector-Wide Implications,” Citigroup, March 19, 2023; BIS Report, p. 27.

⁹³ “Credit Suisse Group: Capital Release Follows Capital Hike,” Bank of America, January 9, 2023.

Swiss National Bank President Thomas Jordan has voiced support for Credit Suisse Group AG ... “We appreciate that Credit Suisse is focusing on its strengths,” Jordan told Swiss radio SRF on Saturday. “That means wealth and asset management and being a universal bank for Switzerland, while doing less investment banking than in the past. This should lead to risks in Credit Suisse’s business diminishing, which is good from a financial stability point of view.” The central bank usually doesn’t comment on individual commercial banks but has left this stance recently with regard to Credit Suisse. *Bloomberg, 17 December 2022.*

Speaking to Swiss public broadcaster SRF, [Swiss Finance Minister] Maurer said: “I am of the opinion that Credit Suisse will turn the corner. It is very important for Switzerland that we have two big banks for the Swiss financial centre and the Swiss business centre.” Credit Suisse is one of Switzerland’s biggest banks covering wealth and asset management, retail and investment banking and deemed, along with UBS and others, as “too big to fail” by the financial regulator. “I think you actually hear good news from Credit Suisse now. They adopted a clear, new strategy, and are implementing that which leads to a massive cost reduction... You just have to leave them alone for a year or two now,” said Maurer. *Swissinfo.ch. 15 December 2022*

We have an interest in having a stable, strong CS again in the future. I am quite confident that this will succeed. *Swiss Finance Minister, quoted on Reuters, 13 December 2022.*

84. Dr. Cain also does not address other potential factors that could affect regulatory decisions, such as that the leadership of the relevant regulators changed. For example, the Swiss Finance Minister, Ueli Maurer, stepped down from his position at the end of December 2022 during the Proposed Class Period and was replaced by Karin Keller-Sutter.⁹⁴ Dr. Cain has not demonstrated that had Credit Suisse made certain “but-for” disclosures when Mr. Maurer was Finance Minister, the regulatory involvement would have been expected to be similar, let alone the same, as the actions taken when Ms. Keller-Sutter was Finance Minister.

85. In sum, to the extent the hypothetical but-for disclosure could have led to expectations of a different regulatory action (e.g., no regulatory assistance, a bailout by the Swiss government, or a merger by UBS but under different terms and structures, including a different degree of government involvement) and a different financial outcome for Credit Suisse and its securities

⁹⁴ Revill, John, “New Swiss Finance Minister Sees Difficult Decisions Ahead,” *Reuters*, December 8, 2022, available at <https://www.reuters.com/world/europe/swiss-appoint-centre-right-keller-sutter-new-finance-minister-2022-12-08/>.

holders, Dr. Cain has not articulated any reliable methodology he could use to model any such events occurring, let alone to calculate the value impact of these events and therefore inflation. In fact, I am not aware of any existing methodology from academic literature, nor has Dr. Cain offered any, that is capable of reliably modeling the changes in market expectations regarding a potential future regulator-facilitated merger in such “but-for” scenarios and hence the price impact of a “but-for” disclosure over time.

2. Dr. Cain Fails to Describe a Damages Methodology That Can Account for a Disclosure That Reflects the Materialization of Risk

86. As discussed in this section, Dr. Cain fails to describe a damages methodology that can account for a disclosure that reflects the materialization of risk. Specifically, Plaintiff links Credit Suisse’s disclosure on March 19, 2023, the announcement of a merger with UBS, to the materialization of a risk of deteriorating liquidity and outflows of customer deposits and assets.⁹⁵ As detailed above, I have already discussed that the ADS price reaction to the March 19, 2023 disclosure represents the market’s reaction to a particular extraordinary event, a regulator-facilitated merger based on specific terms. In this subsection, I discuss that, even aside from this issue, Dr. Cain fails to articulate a methodology that can measure damages related to allegedly understated risks that materialized during a banking crisis.

87. Given that Plaintiff alleges that Defendants misled the market about the degree of a particular risk, any price decline following an alleged disclosure that represents the materialization of risk generally does not represent inflation, because even had the true risk been known by the market, the price typically still would have declined by some amount when that risk ultimately materialized. Instead, any calculation of inflation must be based on the extent to which the market was misled about the risk by the alleged misrepresentations before the risk materialized.

⁹⁵ Consolidated Amended Class Action Complaint for Violations of the Federal Securities Laws, *Ali Diabat v. Credit Suisse Group AG et al.*, Case No. 1:23-cv-5874-CM-SLC, October 5, 2023 (“Complaint”), ¶ 370 (“The March 20, 2023, disclosure fully and finally revealed ... [that] the Company did not maintain an adequate or sufficient liquidity pool and its liquidity and funding profile, policy, and/or risk parameters were not conservative and were materially deficient throughout the [Proposed] Class Period [and that] the Company was experiencing significant and unusual customer and/or asset outflows that never stabilized after October 2022 and Defendants did not disclose this”).

88. Dr. Cain asserts that this type of measurement requires a loss causation analysis aided by fact discovery.⁹⁶ To be clear, I am not suggesting that Dr. Cain needs to perform a loss causation analysis at this stage but rather that his vague and generic references to standard tools do not represent a methodology capable of reliably measuring damages in a manner consistent with the materialization of risk theory of liability that Plaintiff has put forth.

89. Consider the following hypothetical and stylized example related to risk of a bank run. Suppose there were only two potential outcomes in the next year, either (i) a bank will experience a bank run, or (ii) there will be no bank run. Further, suppose the market expects there is a 1% chance that there will be a bank run in the next year and the bank in question will collapse. Additionally, assume there would be a \$1 billion loss to investors from the bank's collapse. In an efficient market, an expected loss of \$10 million (i.e., \$1 billion x 1%) will be incorporated into the market value of the bank's equity.

90. In the event of a bank run that causes the bank to collapse, this leads to a \$990 million decline in value for investors (\$1 billion less the expected loss of \$10 million). Now suppose that absent certain alleged misrepresentations, the market would have expected a 5% chance that there will be a bank run in the next year. Had the true probability been disclosed before the bank run, an additional \$40 million expected loss (i.e., \$1 billion x (5% – 1%)) would have been factored into the value of the bank's equity.

91. The market price, however, would not have reflected the full impact of the \$1 billion loss that was actually realized when the bank run occurred and the bank collapsed. Even in this scenario, the value of the bank's equity would have decreased by \$950 million when the risk materialized. Thus, the full price decline resulting from the realization of a risk is not a reliable measure of inflation resulting from an alleged misrepresentation about the degree of risk and would overstate any inflation and damages.

92. Dr. Cain does not address this circumstance and fails to provide a methodology to assess the extent to which investors were allegedly misled to underestimate the risk that materialized on March 19, 2023, if at all. That is, if the market for Credit Suisse ADSs was efficient during the

⁹⁶ Cain Report, ¶ 179 (“Another input to the above formula, the quantification of artificial inflation per share during the Class Period, is based upon a detailed loss causation analysis. I have not been asked to perform a loss causation analysis at this time, and such analysis often incorporates information produced during discovery.”).

Proposed Class Period, as Dr. Cain claims, then the Credit Suisse ADS price would have incorporated the market's expectations of the risk of large customer deposit and asset outflows or deteriorating liquidity. Consequently, had Credit Suisse made a hypothetical statement earlier in the Proposed Class Period revealing the true nature of the risks it faced, the market would have updated its expectation, but Dr. Cain has provided no basis to assume that the market would have predicted the ultimate outcome with certainty.

93. In fact, Dr. Cain has failed to provide a methodology that could address even the oversimplified example provided above. As previously discussed, in the methodology he describes in his report, Dr. Cain cites the use of an event study and "constant dollar" or "constant percentage" inflation among other generic approaches.⁹⁷ Such analyses would not allow him to calculate damages in this matter, as it would not provide an estimate of the difference between the actual and "but-for" assessments of either (i) the likelihood of an adverse outcome or (ii) the ultimate exposure resulting from such an outcome. There is nothing in Dr. Cain's report that describes in any meaningful detail how one could meet these challenges to measuring inflation in a manner consistent with Plaintiff's theory of liability.

94. To calculate the difference between the actual and "but-for" assessment of (i) the likelihood of an adverse outcome or (ii) the ultimate exposure resulting from such an outcome, Dr. Cain would need to address a challenging problem: how one could measure expectations of liquidity and bank run risk in the "but-for" scenario and how those expectations would have changed over the Proposed Class Period.

95. While Dr. Cain references using documents obtained through discovery in a damages analysis, he does not explain what kind of information he needs and how he would use that information. Moreover, a key complication that Dr. Cain has not addressed is how the context of the broader banking crisis in early 2023 would have affected expectations of liquidity and bank run risk. As discussed above in **Section V.B**, as part of this crisis, bank stock price volatility increased, and bank CDS spreads increased. This banking crisis likely increased the probability that Credit Suisse would have asset outflows and deteriorating liquidity. For example, consistent with this, **Exhibit 11** and **Exhibit 12** show that the CDS spread on 5-year Euro-denominated

⁹⁷ Cain Report, ¶¶ 182–183.

senior debt for Credit Suisse increased from 374 basis points on March 9, 2023 to 1,027 basis points on March 17, 2023.

96. Finally, in addition to the “but-for” scenario, Dr. Cain has also not proposed a methodology for identifying the differences between the market’s “but-for” expectations and the market’s actual expectations of the probability of deteriorating liquidity and outflows of customer deposits and assets, the expected severity of that outcome, and how these differences changed over the Proposed Class Period. Dr. Cain has not explained how he would account for the public information that was available to the market about the risk of customer deposit and asset outflows, liquidity issues, and associated financial distress, which changed over the Proposed Class Period. For example, Credit Suisse made disclosures about the risks it faced related to outflows and liquidity before and during the Proposed Class Period. **Exhibit 13** contains examples of Credit Suisse’s disclosures regarding such risks. Additionally, the Company disclosed AUM and liquidity information on a quarterly basis, and also provided information about these issues outside of the regular quarterly releases.⁹⁸ **Exhibit 3** contains information on Credit Suisse’s asset flows and deposit flows from Q1 2022 through Q1 2023.

3. **Dr. Cain Faces Other Challenges to Calculating Inflation that He Has Not Addressed**

97. Dr. Cain has not proposed a methodology that can account for the changing leverage of the Company associated with the decline in Credit Suisse’s stock price throughout the Proposed Class Period. That is, even if he were able to identify some price decline on March 14, 2023, or March 20, 2023, that was causally linked to the alleged misrepresentations, that decline may not measure inflation (if any) earlier in the Proposed Class Period.

98. As seen in **Exhibit 2**, the Credit Suisse ADS price declined throughout the Proposed Class Period. Specifically, from October 26, 2022, the day before the Proposed Class Period to

⁹⁸ E.g., Credit Suisse provided the market with an “updated outlook” in a November 23, 2022 press release that included information on the Company’s liquidity and asset flows. Specifically, Credit Suisse announced that “as of November 11, 2022, net asset outflows were approximately 6% of assets under management at the end of the third quarter of 2022.” See Credit Suisse Group AG, Form 6-K, November 23, 2022, Press Release, “Credit Suisse Provides Market with Updated Outlook for the Fourth Quarter of 2022,” November 23, 2022.

March 20, 2023, the first trading day after the Proposed Class Period, the Company's ADS price declined by approximately 80% from \$4.79 to \$0.94.⁹⁹

99. Dr. Cain has not described a methodology that can account for the changing leverage (i.e., changing value of debt relative to equity) implied by this change in stock price. Higher levels of leverage mean that negative information about the assets of a company have a greater impact on the value of the company's equity. This is because when a company has more leverage, typically its capacity to absorb negative shocks is reduced, that is, there is an increased risk of financial distress, which can have substantial costs.¹⁰⁰

100. Finally, Dr. Cain has not proposed a damages methodology that is consistent with my understanding of the remaining actionable allegations under the Court's MTD Order. In the MTD Order, the Court identifies numerous alleged misrepresentations that are not actionable. Plaintiff has asserted in the Complaint, however, that the declines on March 14, 2023, and March 20, 2023 were "a direct result of" these alleged misrepresentations.¹⁰¹ See **Exhibit 14** for a list of alleged misrepresentations, which identifies the misrepresentations that I understand from Counsel to still be actionable following the Court's MTD Order. Dr. Cain's methodology does not appear to take into account the Court's MTD Order in that Dr. Cain has not explained how he would remove the impact of the alleged misrepresentations that were deemed not actionable from a measure of damages.

D. Dr. Cain Fails to Provide a Methodology That Is Capable of Measuring Damages Associated with Alleged Misrepresentations Regarding Credit Suisse's ICFR

101. As discussed above, I have been asked by Counsel to separately address whether Dr. Cain has proposed a methodology capable of estimating damages associated with the alleged

⁹⁹ CRSP.

¹⁰⁰ Andrade, Gregor, and Steven N. Kaplan, "How Costly is Financial (Not Economic) Distress? Evidence from Highly Leveraged Transaction that Became Distressed," *The Journal of Finance*, Vol. 53, No. 5, 1995, pp. 1443–1493, at p. 1445 ("For the entire sample, we estimate the costs of financial distress as 10 percent to 20 percent of firm value.").

¹⁰¹ Complaint, ¶¶ 344, 358–359, 367–369, 371 ("The economic loss suffered by Plaintiff and other members of the Class was a direct result of Defendants' misrepresentations and omissions and the subsequent decline in the value of Credit Suisse's securities when Defendants' prior misrepresentations and other fraudulent conduct were revealed.").

misrepresentations regarding Credit Suisse's ICFR. As described in this section, Dr. Cain has not proposed such a methodology.

102. First, as discussed in **Section VI.D.1** below, while Dr. Cain has not indicated how he will measure artificial inflation with an event study (or other generic tools),¹⁰² it is noteworthy that based on Dr. Cain's ADS event study, his finding that the residual return on March 14, 2023 is statistically significant is not robust. If one corrects his unsupported methodological choices, the ADS residual return on that day is no longer statistically significant at the 95% confidence level. From the perspective of financial economics, residual returns that are non-zero, but not statistically significant, are indistinguishable from zero. Dr. Cain has thus not demonstrated that the Credit Suisse ADS price change on March 14, 2023 can be used to measure the change in inflation due to a disclosure regarding Credit Suisse's ICFR.

103. Second, as discussed in **Section VI.D.2** below, Dr. Cain has also not demonstrated that the Credit Suisse ADS price change on March 20, 2023 can be used as part of a damages methodology to measure the change in inflation due to materialization of risks regarding Credit Suisse's ICFR. Dr. Cain fails to address the evidence that is consistent with the notion that the Credit Suisse ADS price would have fully reflected the March 14, 2023 ICFR disclosure before March 20, 2023, if the market for Credit Suisse ADSs was efficient, as Plaintiff claims.

1. Dr. Cain Has Not Demonstrated That the Credit Suisse ADS Price Change on March 14, 2023 Can Be Used to Measure the Change in Inflation Due to a Disclosure Regarding Credit Suisse's ICFR

104. Dr. Cain has not demonstrated that the Credit Suisse ADS price change on March 14, 2023 can be used to measure the change in inflation due to a disclosure regarding the Credit Suisse's ICFR because his finding that the residual return on this day is statistically significant is not robust.

105. This section is organized as follows: First, as discussed in **Section VI.D.1.a**, if one were to correct arbitrary methodological choices Dr. Cain has made, the Credit Suisse ADS price decline on March 14, 2023 is no longer statistically significant at the 95% confidence level. As

¹⁰² While Dr. Cain suggests an event study as part of a damages methodology, Dr. Cain claims that the event study he presents in the Cain Report is "solely for the purpose of evaluating market efficiency" and the event study is "not intended to quantify artificial inflation or to assess loss causation." See Cain Report, footnotes 83, 240.

discussed above in **Section VI.B**, the 95% confidence level is the typical standard for measuring statistical significance that is used in litigation and that is used by Dr. Cain.¹⁰³ Second, as discussed in **Section VI.D.1.b**, the findings of a “placebo” test also raises concerns about the reliability of Dr. Cain’s regression model for analyzing the price impact of disclosures that occurred during the portion of the Proposed Class Period after the failure of Silicon Valley Bank, amid the then ongoing 2023 banking crisis. Third, as discussed in **Section VI.D.1.c**, the lack of statistical significance under alternative event study specifications is not surprising given the prior disclosures made by the Company about its ICFR. Finally, as discussed in **Section VI.D.1.d**, the lack of statistical significance under alternative event study specifications is also not surprising given that academic literature suggests that disclosures like the March 14, 2023 disclosure have limited value relevance.

a) The Credit Suisse ADS Returns Are Not Significant at the 95% Confidence Level on March 14, 2023 Based on Alternative Event Study Analyses

106. On Tuesday, March 14, 2023, Credit Suisse released its 2022 Annual Report by 1:55 AM Eastern Time.¹⁰⁴ Later that morning, at 7:44 AM Eastern Time, Credit Suisse filed a Form 20-F.¹⁰⁵ The 2022 Annual Report included the following disclosure:¹⁰⁶

¹⁰³ Kaye and Freedman (2011), p. 251; Cain Report, ¶ 79.

¹⁰⁴ “Credit Suisse: Confirms 2022 Financial Results As Previously Released On Feb. 9,” *Reuters*, March 14, 2023, available at <https://www.reuters.com/article/brief-credit-suisse-confirms-2022-financ/brief-credit-suisse-confirms-2022-financial-results-as-previously-released-on-feb-9-idUSFWN35L27D/>.

¹⁰⁵ Credit Suisse Group AG, Form 20-F, March 14, 2023.

¹⁰⁶ 2022 Annual Report, p. 50. The identification of a material weakness in Credit Suisse’s ICFR was discussed during the Morgan Stanley European Financial Conference, where the Company’s remarks began at approximately 5:00 AM ET on March 14, 2023. Credit Suisse’s CEO made the following remarks: “So you saw that we pushed out somewhat the publication of our annual report. You saw we -- the annual report was published in line with the Annual Meeting this morning. You also saw, and I think that’s at least one very important message, financial result has not changed, not for 2022 and not for the years before. Secondly, and that was the reason why we briefly pushed it out a bit, we wanted to appropriately respond to feedback which we had from the SEC. And we did, and this was part of a longer dialogue which we had. So we gave them a response. And overall, this has led into, as you say, material weaknesses in the financial reporting controls, which we are, as you would expect from us, addressing very forcefully with the appropriate actions. Because also here, and let me make that point, obviously, our interest in our internal control system is as high as it can be. And we really want to make sure that we are also here best-in-class in terms of what we are doing. I think that’s more or less the whole situation over the last few days.”). See “Credit Suisse Group AG at Morgan Stanley European Financials Conference,” *Refinitiv Streetevents*, March 14, 2023.

Management has identified certain material weaknesses in our internal control over financial reporting as a result of which management has concluded that, as of December 31, 2022, the Group's internal control over financial reporting was not effective, and for the same reasons, management has reassessed and has reached the same conclusion regarding December 31, 2021, as more fully described in this Annual Report. Management has also accordingly concluded that our disclosure controls and procedures were not effective.

107. Dr. Cain finds the residual return on this day was -5.2%, which is statistically significant in his model at the 95% confidence level.¹⁰⁷ Dr. Cain's conclusion about the statistical significance of the residual return on March 14, 2023, however, is the product of his arbitrary decisions.

108. Specifically, when running his regression analysis, Dr. Cain excludes the following sets of days (the "Cain Exclusion Dates") from the estimation window of his event study: alleged corrective disclosure dates, earnings release dates, earnings pre-announcement dates, and two arbitrarily selected "outlier dates" on October 7, 2022 and December 2, 2022.¹⁰⁸ The Credit Suisse ADSs tended to have larger price movements on these "outlier dates."¹⁰⁹ Excluding these larger movement dates from his estimation window when calibrating the model would yield lower statistically significant return thresholds, that is, one, by design, would be more likely to find statistically significant residual returns.¹¹⁰

109. It is imperative that a researcher have objective criteria for determining a set of days to exclude from the estimation period.¹¹¹ Dr. Cain, however, has not detailed the criteria that he used to select the two "outlier dates" that he excludes from his event study.¹¹² I consider three alternative sets of dates to exclude from the estimation window of Dr. Cain's event study, each

¹⁰⁷ Cain Report Production, "OUTPUT CS Event Study.xlsx," tab "ret_SPTR_peer_equ_wt."

¹⁰⁸ Cain Report, footnote 86.

¹⁰⁹ Credit Suisse's ADS price increased from \$4.29 to \$4.85 (13.1%) from October 6, 2022 to October 7, 2022 and from \$3.09 to \$3.38 (9.4%) from December 1, 2022 to December 2, 2022.

¹¹⁰ Excluding the "outlier dates" changes the Root Mean Squared Error ("RMSE") of the model (which Dr. Cain uses for his test of statistical significance) from 3.0% to 2.4%. *See Exhibit 15.*

¹¹¹ Academic research suggests that the removal of outliers (i.e., "extreme observations") can bias the conclusions of a study. *See, e.g.,* Kothari, S.P., Jowell S. Sabino, and Tzachi Zach, "Implications of Survival and Data Trimming for Tests of Market Efficiency," *Journal of Accounting and Economics*, Vol. 39, 2005, pp. 129–161, at p. 129.

¹¹² Dr. Cain references news that Credit Suisse released on the two "outlier dates" (Cain Report, footnote 86). Dr. Cain, however, fails to provide an objective criterion for determining when certain date should be excluded because of company-specific news released on the same date.

based on objective criteria: (i) Cain Exclusion Dates less Dr. Cain’s two arbitrary “outlier dates,” (ii) all alleged misrepresentation dates and corrective disclosure dates that I understand from Counsel were deemed “actionable” in the MTD Order, and (iii) all alleged misrepresentation dates and corrective disclosure dates listed in the Complaint.

110. When I replace the Cain Exclusion Dates with each of these three alternative sets of exclusion dates, but otherwise use his regression model specification, the event studies would result in residual returns on March 14, 2023 that are not statistically significant at the 95% confidence level, as shown in **Exhibit 15**. As discussed above, the 95% confidence level is the typical measure of statistical significance used in the context of litigation and the measure used by Dr. Cain.¹¹³

b) A “Placebo” Test Raises Concerns About the Reliability of Using Dr. Cain’s Regression Model for Analyzing Disclosures That Occurred During the Portion of the Proposed Class Period After the Failure of Silicon Valley Bank

111. Additionally, I have conducted a “placebo” test to analyze Dr. Cain’s regression model. This “placebo” test raises concerns about the reliability of using Dr. Cain’s regression model for analyzing disclosures that occurred during the portion of the Proposed Class Period after the failure of Silicon Valley Bank (i.e., from March 13, 2023 through March 17, 2023).¹¹⁴ As noted above, and described in **Section V.B**, the March 14, 2023 disclosure occurred shortly after the failure of Silicon Valley Bank, during the then ongoing banking crisis.

112. Dr. Cain’s regression model for analyzing March 14, 2023, is estimated using primarily data from before the failure of Silicon Valley Bank (September 20, 2023–March 9, 2023) and therefore may not be suited for analyzing days amid the 2023 banking crisis. As discussed above, volatility of bank stocks increased substantially after the failure of Silicon Valley Bank.

113. To test whether Dr. Cain’s regression model is suitable for modeling Credit Suisse ADS returns, I conducted regression analyses using Dr. Cain’s methodology for each of the eight companies he included in his industry index: Bank of America, Barclays, Citigroup, Deutsche

¹¹³ Kaye and Freedman (2011), p. 251; Cain Report, ¶ 79.

¹¹⁴ For this analysis, I exclude Friday, March 10, 2023, the day of the failure of Silicon Valley Bank and focus on the portion of the Proposed Class Period after the failure of Silicon Valley bank that excludes this day.

Bank, Goldman Sachs, J.P. Morgan Chase, Morgan Stanley, and UBS.¹¹⁵ That is, instead of predicting returns for Credit Suisse ADSs, I applied Dr. Cain's methodology to predict returns for each of the components of his industry index.¹¹⁶ The results of this test are included as

Exhibit 16.

114. Based on using a 95% confidence level, I would expect that, randomly, approximately 5% of days analyzed would have statistically significant residual returns.¹¹⁷ As seen in this exhibit, however, I find that 21.6% of day-company combinations show statistical significance during the March 13, 2023–March 17, 2023 period, as compared to 4.4% during the remainder of the Proposed Class Period before March 10, 2023.¹¹⁸ This finding suggests that the stock returns of companies included in Dr. Cain's index (companies that would not be directly impacted by any alleged misrepresentations or omissions made by Credit Suisse) are more likely to be statistically significant during the post-Silicon Valley Bank period.¹¹⁹ This suggests that findings of statistically significant residual returns using Dr. Cain's model may be due to a regression model that is unsuited for analyzing the stock returns during the 2023 banking crisis.

115. For robustness, I have also conducted a similar analysis using the constituents of the KBW Bank Index. That is, I use Dr. Cain's model to analyze a set of companies, that, like Credit Suisse, may have been affected by the then ongoing banking crisis. As shown in **Exhibit 16**, I reach the same conclusion.

¹¹⁵ Cain Report, footnote 85.

¹¹⁶ When applying Dr. Cain's methodology to predict returns for a company included in the Cain Peer Index, I exclude this company from the calculation of industry index returns. For example, I exclude Bank of America from the calculation of industry index returns when using Dr. Cain's methodology to predict returns for Bank of America.

¹¹⁷ MacKinlay (1997), pp. 20–21 (“Under the null hypothesis, conditional on the event window market returns, the abnormal returns will be jointly normally distributed”); Stock, James H., and Mark W. Watson, *Introduction to Econometrics*, Fourth Edition (Hoboken, NJ: Pearson, 2020), p. 75 (“[T]he normal density with mean μ and variance σ^2 is symmetric around its mean and has 95% of its probability between $\mu-1.96\sigma$ and $\mu+1.96\sigma$.”). Excluding the Cain Exclusion Dates, Dr. Cain finds that 5 of 87 days (5.75 %) in the Proposed Class Period before the failure of Silicon Valley Bank on March 10, 2023 are statistically significant. See Cain Report Production, “OUTPUT CS Event Study.xlsx,” tab “ret_SPTR_peer_equ_wt.”

¹¹⁸ Consistent with Dr. Cain's analysis, I exclude UBS starting March 15, 2023, when “rumors began to circulate that UBS could merge with Credit Suisse.” See Cain Report, footnote 85.

¹¹⁹ As shown in **Exhibit 16**, on March 13, 2023, the day before the “revelatory event” on March 14, 2023, residual returns of 37.5% of Cain Peer Index constituents are statistically significant. For the KBW Bank Index, residual returns of 77.3% of constituents are statistically significant.

c) The Lack of Statistical Significance Under Alternative Event Study Specifications is Not Surprising Given Prior Disclosures by the Company

116. The lack of a statistically significant residual return on March 14, 2023 in the alternative event study specifications described in **Section VI.D.1.a** above is not surprising as much information had already been available to market participants about the accounting issues underlying the material weakness in ICFR before March 14. Specifically, in its 2021 Annual Report, which was published on March 10, 2022 (i.e., roughly one year before), Credit Suisse stated that it revised prior year financials as a result of an “accounting issue” that was discovered “[i]n connection with ongoing internal control processes.”¹²⁰ Specifically, Credit Suisse disclosed the following:

In connection with ongoing internal control processes, the Group identified accounting issues that were not material individually or in aggregate to the prior period financial statements. As a result of these accounting issues prior periods have been revised in the consolidated financial statements and the related notes.

The Group identified accounting issues with respect to the netting treatment relating to the presentation of a limited population of certain securities lending and borrowing activities. As a result, balance sheet and cash flow positions for both assets and liabilities relating to these activities were understated.

Separately, in the consolidated statements of cash flows share-based compensation expenses, net were previously included in net cash provided by/(used in) financing activities, but are now separately included in net cash provided by/(used in) operating activities.¹²¹

117. Additionally, on March 9, 2023, Credit Suisse issued a press release disclosing that it was delaying the publication of its 2022 Annual Report, “following a late call on the evening of March 8, 2023, from the [SEC] in relation to certain open SEC comments about the technical assessment of previously disclosed revisions to the consolidated cash flow statements in the years ended December 31, 2020 and 2019, as well *as related controls.*”¹²² That is, Credit Suisse

¹²⁰ 2021 Annual Report, p. 292.

¹²¹ 2021 Annual Report, p. 292.

¹²² Credit Suisse Group AG, Form 6-K, March 9, 2023, Press Release, “Credit Suisse Announces Technical Delay of Publication of 2022 Annual Report,” March 9, 2023 (emphasis added).

had already disclosed that there were unresolved comments from the SEC about the Company's controls before the March 14, 2023 disclosure. These issues led to the delay in publication of its 2022 Annual Report. On March 9, 2023, however, based on Dr. Cain's event study model, the Credit Suisse ADS price did not experience a statistically significant decline.¹²³

d) Academic Literature Suggests ICFR Disclosures Like the March 14, 2023 Disclosure May Have Limited Value Relevance

118. The finding that the March 14, 2023 residual return was not statistically significant is also not surprising given the evidence from the academic literature. Specifically, academic literature suggests that such disclosures have limited value relevance. An academic study by Beneish, Billings, and Hodder (2008) finds no statistically significant negative market reaction to Section 404 disclosures of adverse ICFR findings for audited firms.¹²⁴ They argue that the lack of market response to disclosures can be due to the following factors. First, accelerated filers (i.e., larger companies, including Credit Suisse) may have lower thresholds for disclosure because their internal controls are independently audited.¹²⁵ Additionally, the market's reaction to disclosures may be attenuated by firm attributes associated with accelerated filers, such as larger size and higher quality auditors.¹²⁶

¹²³ Dr. Cain finds a residual return of 2.0%, which is not statistically significant. *See Cain Report Production, "OUTPUT CS Event Study.xlsx," tab "ret_SPTR_peer_equ_wt."* I find the same result (lack of negative significance) based on the modified models described above that exclude alternative days from the estimation period. I have reviewed the analyst reports between March 8, 2023 and March 13, 2023, the day before the March 14, 2023 disclosure, and have not identified any analyst commentary that discusses confounding information that would have potentially offset an otherwise negative statistically significant residual return on March 9, 2023.

¹²⁴ Beneish, Messod Daniel, Mary Brooke Billings, and Leslie D. Hodder, "Internal Control Weaknesses and Information Uncertainty," *The Accounting Review*, Vol. 83, No. 3, 2008, pp. 665–703 ("Beneish, Billings, and Hodder (2008)"), at p. 690 ("At conventional levels, we find no abnormal returns incident to Section 404 disclosures in any partition."). *See also* Beneish, Billings, and Hodder (2008), Table 5, p. 668 ("Section 404 imposes affirmative responsibilities on management and the company's independent auditor to detect material weaknesses in internal controls. Specifically, Section 404 requires management to document and test the efficacy of internal controls and to issue annually an internal control report in which management must make either positive assertions concerning the effectiveness of internal controls, or disclose the nature of deficiencies and weaknesses that render controls ineffective. The company's auditor must issue a separate opinion over management's assertions to be included in the annual report."). The March 14, 2023 ICFR disclosure was made in the 2022 Annual Report, which included an opinion by the auditor on Credit Suisse's ICFR. *See* 2022 Annual Report, p. 258.

¹²⁵ Beneish, Billings, and Hodder (2008), p. 690.

¹²⁶ Beneish, Billings, and Hodder (2008), p. 690.

119. While another study by Adhikari, Guragai, and Seetharaman (2020) shows that markets generally react negatively to the first-time disclosures of adverse ICFR audits after the adoption of Auditing Standard No. 5 (fiscal years ending after November 15, 2007), they do not find a “strong significant negative market reaction” (i.e., the results are statistically significant at the 90% confidence level, but not the 95% confidence level, with a price impact of -0.01% to -0.09% depending on the measurement window) for large accelerated filers (companies with public float of more than \$700 million).¹²⁷ The authors argue that perhaps this finding is “suggesting that information about the ICFR for large filers is already incorporated into their stock prices.”¹²⁸

2. Dr. Cain Has Not Shown How He Could Use the Return on March 20, 2023 as a Measure of Inflation Earlier in the Proposed Class Period Associated with Allegations About the Company’s ICFR

120. Dr. Cain has also not shown how he could use the residual return on March 20, 2023 as a measure of inflation earlier in the Proposed Class Period associated with alleged misrepresentations and omissions about the Company’s ICFR.

121. Specifically, on Sunday, March 19, 2023, Credit Suisse announced that the Company was merging with UBS. On Monday, March 20, 2023, the Credit Suisse ADS price declined on a residual basis by 53.3% based on Dr. Cain’s event study model.¹²⁹ Empirical evidence and findings from academic literature, however, are consistent with the Credit Suisse ADS price fully reflecting the March 14, 2023 ICFR disclosure before March 20, 2023 in an efficient market. Dr. Cain has failed to explain how he could use any price decline on March 20, 2023 to measure value impact of information that had already been incorporated into Credit Suisse’s price before that day.

122. As an initial matter, Dr. Cain asserts that Credit Suisse ADSs traded in an efficient market.¹³⁰ Academic literature indicates that, in an efficient market, information is typically

¹²⁷ Adhikari, Subash, Binod Guragai, and Ananth Seetharaman, “Market Response to Audited Internal Control Weakness Disclosures,” *Journal of Forensic Accounting Research*, Vol. 5, No. 1, 2020, pp. 2–20 (“Adhikari, Guragai, and Seetharaman (2020)”), pp. 11, 13–14.

¹²⁸ Adhikari, Guragai, and Seetharaman (2020), p. 4.

¹²⁹ Cain Report Production, “OUTPUT CS Event Study.xlsx,” tab “ret_SPTR_peer_equ_wt.”

¹³⁰ Dr. Cain opines that a “market is considered informationally efficient when the market price of securities begins to respond quickly to publicly available information.” He also opines that the “markets

impounded into a company's stock price within one trading day.¹³¹ In his report, Dr. Cain has provided no evidence that it would take longer than one day for information about Credit Suisse's ICFR to be fully incorporated into the Credit Suisse ADS price. As discussed above, this is especially the case as the market had already been given notice about the cash flow statement issues, the unresolved issues with the SEC's comments, and potential "related control" issues before March 14, 2023.

123. Critically, as discussed above, information regarding the Company's material weakness in ICFR was already disclosed during the early morning hours of March 14, 2023.¹³² Based on

for Credit Suisse, ADSs, Credit Suisse Options, and Credit Suisse Notes were efficient throughout the [Proposed] Class Period." See Cain Report, ¶¶ 3, 23.

¹³¹ See, e.g., Fama, Eugene F., "Efficient Capital Markets: II," *The Journal of Finance*, Vol. 46, No. 5, 1991, pp. 1575–1617 ("Fama (1991)"), at pp. 1601–1602 ("The typical result in event studies on daily data is that, on average, stock prices seem to adjust within a day to event announcements. The result is so common that this work now devotes little space to market efficiency. The fact that quick adjustment is consistent with efficiency is noted, and then the studies move on to other issues. In short, in the only empirical work where the joint hypothesis problem is relatively unimportant, the evidence typically says that, with respect to firm-specific events, the adjustment of stock prices to new information is efficient."). Dr. Cain cites Fama (1991) as part of his opinion that "[e]conomics research and literature support the concept of market efficiency for publicly traded securities." See Cain Report, ¶ 23. See also Das, Somnath, and Alexander Z. King, "Measuring the Informativeness of Earnings Announcements: The Role of Event Windows," *The Quarterly Review of Economics and Finance*, Vol. 82, 2021, pp. 350–367 ("Das and King (2021)"). Das and King (2021) decompose each trading day return into two half-day returns (bifurcating returns into trading hours and after hours returns). Given the bifurcation of a daily return, the earnings announcement return is set to period 0.0 and each period (half-day) decrements or increments this count by half a unit. They find that, for earnings announcements made after hours, "the event window that includes the after-hours announcement period to the following trading day (period (0.0, +0.5)) is the most informative ... in Models 5 and 6 we expand the event windows: (-1.5, +1.0) and (-1.0, +1.5) ... For Models 5 and 6 to be more informative, they would need to report at least 1.6% higher R-Sq than Model 4's result of 4.02%. Both Models 5 and 6 fail to meet this minimum, leading us to conclude that inclusion of these additional periods do not provide significant incremental information." See also Busse, Jeffrey A., and T. Clifton Green, "Market Efficiency in Real Time," *Journal of Financial Economics*, Vol. 65, No. 3, 2002, pp. 415–437, which find that stock prices respond within seconds to positive news and within "15 minutes" to negative news discussed on CNBC's Morning and Midday Call Report. See also Beaver, William H., Maureen F. McNichols, and Zach Z. Wang, "Increased Market Response to Earnings Announcements in the 21st Century: An Empirical Investigation," *Journal of Accounting and Economics*, Vol. 69, No. 1, 2020, which finds that "the response to earnings information occurs primarily on day 0."

¹³² 2022 Annual Report, p. 50. The identification of a material weakness in Credit Suisse's ICFR was also discussed during the Morgan Stanley European Financial Conference, where the Company's remarks began at approximately 5:00 AM ET on March 14, 2023. See "Credit Suisse Group AG at Morgan Stanley European Financials Conference," *Refinitiv Streetevents*, March 14, 2023.

my review of information that was released between March 14, 2023 and March 20, 2023, I did not identify additional information disclosed regarding ICFR after March 14, 2023.¹³³

124. I also looked for potential post-announcement “drift,” that is, a continued price decline from March 14, 2023, which may suggest that the ADS price needed time to incorporate the information gradually. While the residual return on March 15, 2023, was negative and statistically significant, it followed statements by the Chairman of the Saudi National Bank.¹³⁴ The residual returns on March 16, 2023, and March 17, 2023, were both not statistically significant based on Dr. Cain’s statistical analyses (as well as in the sensitivity analyses I conducted).¹³⁵

125. Thus, there is no evidence of ongoing post-announcement drift after March 15, 2023 (i.e., there is no continual statistically significant price decline from March 14, 2023 to March 20, 2023.). Therefore, both the empirical analysis and the academic evidence are consistent with the notion that Credit Suisse’s ADS price had fully reflected the March 14, 2023 ICFR disclosure before March 20, 2023, if Plaintiff is correct in his claim that the ADS market was efficient. Dr. Cain has not explained how he would address this case circumstance.

VII. Dr. Cain Fails to Provide a Methodology That Would Reliably Calculate Damages for Credit Suisse Options in a Manner Consistent with Plaintiff’s Theory of Liability

126. As an initial matter, Dr. Cain’s discussion of damages in relation to the Credit Suisse Options suffers from the same flaws as his discussion for the Credit Suisse ADSs. Rather than providing a methodology that can measure damages on a class-wide basis consistent with

¹³³ I reviewed public press articles available from *Factiva* based on a search of English language articles referencing “Credit Suisse” and at least one of (i) “internal control,” (ii) “internal controls”, or (ii) “ICFR.” This search excludes sports, obituaries, and republished news, as well as SEC filings. Separately, I also reviewed Credit Suisse’s SEC filings and available analyst report commentary.

¹³⁴ The Chairman of the Saudi National Bank, Credit Suisse’s largest shareholder, announced in an interview on March 15, 2023 that it could not purchase additional shares of Credit Suisse: “We cannot because we would go above 10%. It’s a regulatory issue.” *See Uppal, Rachna, “Credit Suisse’s Biggest Backer Says Can’t Put Up More Cash; Share Down by a Fifth,” Reuters*, March 15, 2023, available at <https://www.reuters.com/business/finance/credit-suisses-saudi-backer-happy-with-transformation-plan-doesnt-think-extra-2023-03-15/>. *See also* Cain Report Production, “OUTPUT CS Event Study.xlsx,” tab “ret_SPTR_peer_equ_wt.”

¹³⁵ Cain Report Production, “OUTPUT CS Event Study.xlsx,” tab “ret_SPTR_peer_equ_wt.”

Plaintiff's theory of liability, Dr. Cain instead provides a vague and generic discussion on potential models that he purports could be used.

127. Dr. Cain's proposed methodology for calculating damages for Credit Suisse Options appears to be directly linked to his methodology for calculating damages for Credit Suisse ADSs. Specifically, with regard to calculating damages for the Credit Suisse Options, Dr. Cain states that “[d]amages relating to Credit Suisse Options can also be calculated in a similar manner and utilizing the same techniques described above.”¹³⁶ He states that “[o]nce artificial inflation for the Credit Suisse ADS is estimated, the embedded inflation contributing to an option’s price can change based on a number of factors.”¹³⁷ Dr. Cain notes that “[t]hese factors include, but are not limited to, the level of the ADS price in relation to the strike price, time to maturity, and volatility.”¹³⁸

128. As an example, Dr. Cain proposes using “options pricing methodologies, such as the widely utilized Black-Scholes pricing model or the binomial model, to infer the inflation at the time of each Class member’s purchase and sale,”¹³⁹ by “changing the underlying price of the security in the equation to reflect the removal of the artificial inflation assessed for the ADS price.”¹⁴⁰

129. Under the approach discussed by Dr. Cain, artificial inflation in Credit Suisse’s ADS is an input to calculate artificial inflation in Credit Suisse Options. As explained in **Section VI** above, Dr. Cain fails to provide a methodology that would reliably estimate artificial inflation in the Credit Suisse ADSs. Hence, the same issues described in **Section VI** above would make Dr. Cain’s proposed approach to estimate artificial inflation for the Credit Suisse Options unreliable.

130. Furthermore, the proposed approach suffers from another shortcoming. That is, Dr. Cain fails to show that the only impact of the alleged misrepresentations on the value of the options would have been through the artificial inflation of the price of the underlying stock (i.e., Credit Suisse ADSs). As noted above, Dr. Cain concedes that there are other factors that influence the

¹³⁶ Cain Report, ¶ 186.

¹³⁷ Cain Report, ¶ 186.

¹³⁸ Cain Report, ¶ 186.

¹³⁹ Cain Report, ¶ 187.

¹⁴⁰ Cain Report, ¶ 188.

value of an option, including, critically, the volatility of the stock.¹⁴¹ For example, as Dr. Cain explains, “option value may also increase if the implied volatility of the ADS increases.”¹⁴² If the alleged corrective disclosures would have resulted in a change in the volatility of the Credit Suisse ADSs, then the approach proposed by Dr. Cain would not result in a reliable measure of artificial inflation for the Credit Suisse Options.

131. Importantly, Dr. Cain would need to be able to identify the appropriate “but-for” volatility separately for each individual option. Implied volatility refers to the volatility of the stock that is implied by the option price observed in the market.¹⁴³ As shown in **Exhibit 17**, for any given day, implied volatilities, as reported by *iVolatility*, vary based on the type of option (call or put), strike price, and expiration date. For example, on March 17, 2023, the last day of the Proposed Class Period, implied volatility ranged from 88 percent to 600 percent.¹⁴⁴ As also shown in **Exhibit 17**, the implied volatility of the Credit Suisse Options also changed over time. In particular, the implied volatilities increased substantially toward the end of the Proposed Class Period.

132. Further, the implied volatilities of the Credit Suisse Options changed in different directions and different magnitudes following the “revelatory events.” That is on both March 14, 2023 and March 20, 2023, the implied volatilities of some Credit Suisse Options increased, while the implied volatilities of other options decreased.¹⁴⁵ In order to calculate damages, Dr. Cain would have to identify the “but-for” volatility for each option series throughout the Proposed Class Period, that is, the volatility absent the alleged misrepresentations. Dr. Cain, however, has not provided any explanation of how he could address this issue.

¹⁴¹ Cain Report, ¶ 187 (“One can employ various options pricing methodologies, such as the widely utilized Black-Scholes pricing model or the binomial model, to infer the inflation at the time of each Class member’s purchase and sale. These models provide a way to value an option as a function of the variables that influence option values: the strike price, time to expiration, risk-free interest rate, volatility of the underlying security, and the current market price of the underlying security.”).

¹⁴² Cain Report, ¶ 103.

¹⁴³ Hull (2022), p. 336.

¹⁴⁴ *iVolatility*.

¹⁴⁵ For example, on March 14, 2023, the implied volatility of the put with a strike price of \$0.50 and an expiration date of April 21, 2023 increased from 159.7% to 342.1%, and the implied volatility of the call with a strike price of \$1.00 and an expiration date of March 24, 2023 decreased from 265.0% to 249.6%. On March 20, 2023, the implied volatility of the call with a strike price of \$9.90 and an expiration date of January 17, 2025 increased from 88.0% to 93.9%, and the implied volatility of the call with a strike price of \$1.00 and an expiration date of April 14, 2023 decreased from 515.2% to 133.2%. See *iVolatility*.

VIII. Dr. Cain Fails to Provide a Methodology That Would Reliably Calculate Damages for Credit Suisse Notes in a Manner Consistent with Plaintiff's Theory of Liability

133. Dr. Cain's vague and generic discussion of damages in relation to the Credit Suisse Notes suffers from the same flaws as his discussion for the Credit Suisse ADSs, as well as additional flaws that are specific to the Credit Suisse Notes.

134. In fact, Dr. Cain does not present a damages methodology for the Credit Suisse Notes that is separate from his methodology for Credit Suisse ADSs. That is, it appears that Dr. Cain suggests the same generic approach to calculate damages for the Credit Suisse Notes as the one he discusses for the Credit Suisse ADSs. In summary, like for the ADSs (as described in **Section VI.A**), Dr. Cain suggests the use of the “‘out-of-pocket’ method,”¹⁴⁶ and the use of an event study or other generic methodologies for the Credit Suisse Notes to quantify artificial inflation per note during the Proposed Class Period.¹⁴⁷

135. In addition to not addressing the distinctive economic circumstances discussed above in **Section VI**, the Credit Suisse Notes pose additional challenges that Dr. Cain has not shown that he can address. These challenges arise because the determinants of the values of fixed-income securities and equity are different. A unique challenge arises here also because the alleged “revelatory events” in this matter in fact had different value implications for the notes than for the ADSs.

136. First, Dr. Cain fails to explain how he plans to measure the change in artificial inflation for the Credit Suisse Notes resulting from the allegedly “revelatory event” on March 19, 2023. Specifically, following the announcement of the merger with UBS, Dr. Cain’s event study shows that six out of the seven Credit Suisse Notes have *positive* and statistically significant residual returns at the 95% confidence level on March 20, 2023.¹⁴⁸ The remaining one Credit Suisse Note also has a positive residual return that was not statistically significant at the 95% confidence level.

137. The increase in the price of these six Credit Suisse Notes on March 20, 2023, in contrast to the sharp decline in the ADS prices on that day, further illustrates the unique circumstances in this matter: as a result of the assumption of Credit Suisse’s debt by UBS as part of its acquisition

¹⁴⁶ Cain Report, ¶ 177.

¹⁴⁷ Cain Report, ¶ 179.

¹⁴⁸ Cain Report, Exhibit 17.

of the Company (instead of a more adverse outcome, such as that experienced by AT1 noteholders),¹⁴⁹ the holders of Credit Suisse Notes actually *benefited* from the takeover deal facilitated by the Swiss government. Given the opposite price reactions of the Credit Suisse Notes versus that of the ADSs, Dr. Cain fails to explain how his methodology can be used to estimate damages under the same theory of liability for investors in the Credit Suisse Notes and Credit Suisse ADSs.

138. Second, the Credit Suisse Notes are more senior in the capital structure than the Credit Suisse's common stock and the associated Credit Suisse ADSs. This provides investors in the Credit Suisse Notes an equity cushion.¹⁵⁰ This equity cushion is larger when the price of Credit Suisse's stock is higher. Thus, the prices of the Credit Suisse Notes might be *less responsive* to negative news about Credit Suisse (e.g., alleged corrective information) when its stock price is higher than when it is lower. As a result, the Credit Suisse Notes' price reactions on the alleged corrective disclosure dates are unlikely to be an appropriate measure of artificial inflation (i.e., the price reaction when the hypothetical "but-for" information would have been disclosed) at an earlier point in time. Dr. Cain has failed to provide a damages methodology that can deal with this issue.

139. For example, as a result of this time-varying equity cushion, if one were to assume a "constant dollar inflation" for the Credit Suisse ADSs, then the same model would not be appropriate for the Credit Suisse Notes. Dr. Cain fails to provide an explanation on how one can deal with interconnectedness among Credit Suisse's securities when modeling the evolution of artificial inflation throughout the Proposed Class Period.

140. Because he has neither addressed the challenges described in **Section VI** above that apply to both Credit Suisse ADSs and Credit Suisse Notes, nor addressed the specific challenges for calculating damages for the Credit Suisse Notes in this case, Dr. Cain fails to provide a

¹⁴⁹ Credit Suisse Group AG, Form 6-K, March 20, 2023, Press Release, "Credit Suisse and UBS to Merge," March 19, 2023, p. 1.

¹⁵⁰ See, e.g., Brealey, Richard A., Stewart C. Myers, Franklin Allen, and Alex Edmans, *Principles of Corporate Finance*, Fourteenth Edition (New York, NY: McGraw Hill Education, 2023), pp. 372–375 ("[C]ommon stock is a *residual claim* on the firm's assets and cash flow... Debt has a prior claim on cash flows, but its claim is limited to the amount of the debt. Therefore, in contrast to equity, it does not have residual cash-flow rights and it does not participate in the upsides of the business.").

methodology that would reliably calculate damages for Credit Suisse Notes consistent with Plaintiff's theory of liability.

IX. Dr. Cain Fails to Reliably Demonstrate that the Credit Suisse Options Traded in Efficient Markets During the Proposed Class Period

141. Dr. Cain opines in his report that the Credit Suisse Options "traded in an efficient market during the [Proposed] Class Period."¹⁵¹ As support for this conclusion, Dr. Cain relies on his findings regarding an entirely different security: the Credit Suisse ADSs. Dr. Cain also conducts a limited analysis of the directionality of price movements for a small subset of the Credit Suisse Options,¹⁵² and dismisses the relevance of *Cammer* and *Krogman* factors as "not directly applicable to options as tests of market efficiency."¹⁵³ As I discuss in detail below, Dr. Cain's analyses are flawed, and therefore fail to demonstrate that the Credit Suisse Options traded in efficient markets during the Proposed Class Period.

142. This section proceeds as follows. First, as discussed in **Section IX.A**, Dr. Cain's claim that a finding of market efficiency for Credit Suisse ADSs directly translates to a finding of market efficiency for the Credit Suisse Options is flawed. Second, as discussed in **Section IX.B**, Dr. Cain has not performed an analysis of market efficiency for most, let alone all, of the option series on Credit Suisse ADSs. Rather, he has only analyzed a very small proportion (2.5%) of Credit Suisse Options series that might be expected to be the most liquid and actively traded during the Proposed Class Period, even though each option series is a distinct security with its own economic characteristics. Third, as discussed in **Section IX.C**, Dr. Cain's analysis of price movements for the small fraction of Credit Suisse Options he does analyze is not supported by academic literature and does not reliably support a conclusion of market efficiency. Fourth, as discussed in **Section IX.D**, most of the Credit Suisse Options traded infrequently during the Proposed Class Period and exhibited elevated bid-ask spreads. Dr. Cain incorrectly dismisses the implications of low trading volume and high bid-ask spreads for the market efficiency of the Credit Suisse Options.

¹⁵¹ Cain Report, ¶ 109.

¹⁵² Cain Report, ¶¶ 105–106.

¹⁵³ Cain Report, ¶ 103.

A. Dr. Cain’s Claim That a Finding of Market Efficiency for Credit Suisse ADSs Directly Translates to a Finding of Market Efficiency for All Credit Suisse Options is Flawed

143. According to Dr. Cain, securities trade in efficient markets “when the market price of securities begins to respond quickly to publicly available information.”¹⁵⁴ Dr. Cain evaluates the market for Credit Suisse ADSs and concludes that the Credit Suisse ADSs “traded in an efficient market throughout the [Proposed] Class Period.”¹⁵⁵ Dr. Cain asserts that “[b]ecause options pricing is dependent on the ADS price, the artificial inflation caused by any misrepresentations and omissions that affect the ADS price would quickly translate into the value of derivative instruments such as call and put options on Credit Suisse ADSs.”¹⁵⁶ Dr. Cain is mistaken.

144. Dr. Cain attempts to support this purported link between the efficiency of the markets for Credit Suisse ADSs and Credit Suisse Options based on selected academic articles. According to Dr. Cain, these academic articles supposedly show that “[mispricing] opportunities do not persist in general due to the efficiency of option pricing.”¹⁵⁷

145. In reaching his conclusions, however, Dr. Cain ignores academic literature showing instances of market inefficiencies in options markets, even when the option trades on a large options exchange, such as the Chicago Board Options Exchange (“CBOE”), the venue on which Credit Suisse Options traded.¹⁵⁸ Specifically, Dr. Cain ignores academic literature that documents instances of persistent mispricing in options. In an efficient market, any transitory mispricing of a security should be “arbitraged” away by investors buying an underpriced security and selling an overpriced security. In an *inefficient* market, however, transaction costs and risks can impede the ability of investors to take advantage of persistent mispricing.¹⁵⁹

¹⁵⁴ Cain Report, ¶ 23. I note that this description may not be consistent with the definition of market efficiency in peer-reviewed research in financial economics because Dr. Cain seems to allow efficient market to *begin* reacting quickly to new public information and to *continue* reacting for days and possibly weeks. As discussed above, academic literature indicates that, in an efficient market, information is typically impounded into a company’s stock price within one trading day.

¹⁵⁵ Cain Report, ¶ 30.

¹⁵⁶ Cain Report, ¶ 108.

¹⁵⁷ Cain Report, ¶ 99.

¹⁵⁸ Cain Report, ¶ 104.

¹⁵⁹ Pontiff, Jeffrey, “Costly Arbitrage and the Myth of Idiosyncratic Risk,” *Journal of Accounting & Economics*, Vol. 42, 2006, pp. 35–52, at pp. 35–36.

146. Academic literature documents evidence of such limits to arbitrage for options. For example, Cao and Han (2013) analyze data on options on U.S. stocks between 1996 and 2009,¹⁶⁰ and identify an anomalous negative relationship between the return of a hedged option and its volatility.¹⁶¹ They further show that this observed anomalous relationship can be explained by the fact that investors cannot always take advantage of mispricing opportunities in options due to high transaction costs in the form of a high bid-ask spread.¹⁶²

147. Similarly, Santa-Clara and Saretto (2009) analyze the profitability of trading in S&P 500 futures options listed on the CME and S&P 500 Index options listed on the CBOE between 1985 and 2006.¹⁶³ They observe high returns in writing put options that are not arbitrated away due to margin requirements and transaction costs:¹⁶⁴ “[t]rading options can be quite expensive … most importantly, because of the large bid-ask spreads at which options are quoted.”¹⁶⁵

¹⁶⁰ Cao, Jie, and Bing Han, “Cross Section of Option Returns and Idiosyncratic Stock Volatility,” *Journal of Financial Economics*, Vol. 108, No. 1, 2013, pp. 231–249 (“Cao and Han (2013)”), at p. 233, Table 1.

¹⁶¹ Cao and Han (2013), p. 231 (“This paper presents a robust new finding that delta-hedged equity option return decreases monotonically with an increase in the idiosyncratic volatility of the underlying stock. This result cannot be explained by standard risk factors. It is distinct from existing anomalies in the stock market or volatility-related option mispricing. It is consistent with market imperfections and constrained financial intermediaries.”). Cao and Han (2013) specifically analyze the returns of delta-hedged options, which represent options hedged so that they are “not sensitive to stock price movement.” See Cao and Han (2013), p. 232.

¹⁶² Cao and Han (2013), p. 241 (“[W]e provide evidence that our results can be better understood under models of option valuation in imperfect market[s] (e.g., limits to arbitrage between options and stocks) … We use option bid-ask spread as another proxy of limits to arbitrage. First, the option bid-ask spreads limit the arbitrage activities by creating a no-trade region. Second, Jameson and Wilhelm (1992) show that option market makers face unique risk in managing inventory (including the risk associated with the inability to rebalance delta hedges and uncertain volatility.”).

¹⁶³ Santa-Clara, Pedro, and Alessio Saretto, “Option Strategies: Good Deals and Margin Calls,” *Journal of Financial Markets*, Vol. 12, No. 3, 2009, pp. 391–417 (“Santa-Clara and Saretto (2009)”), at pp. 391, 394.

¹⁶⁴ Santa-Clara and Saretto (2009), p. 414 (“Previous studies report unusually high returns to option strategies that involve writing put options. The contribution of this paper is to show that the returns realizable by investors subject to the margining systems are not as large as previously documented. We show that, if margins are taken into account, part of the ‘un-margined’ returns is not available to investors. Therefore, while volatility and jump risk premia are priced into option prices, limits to arbitrage, represented by transaction costs and margin requirements, might blunt the effectiveness of option markets for risk sharing among investors.”).

¹⁶⁵ Santa-Clara and Saretto (2009), p. 398. As another example of limits to arbitrage in options market, Ofek et al. (2004) document mispricing in options due to high costs of short selling. See Ofek, Eli, Matthew Richardson, and Robert F. Whitelaw, “Limited Arbitrage and Short Sales Restrictions: Evidence from the Options Markets,” *Journal of Financial Economics*, Vol. 74, No. 2, 2004, pp. 305–342, at p. 305 (“We investigate empirically the well-known put-call parity no-arbitrage relation in the presence of short sales restrictions.”).

148. Academic literature thus documents instances of persistent option mispricing, even on major options exchanges such as CBOE. The common theme of the literature is that option markets have high transaction costs that can and do, in some instances, lead to market inefficiencies. The efficiency of the market for each Credit Suisse Option thus cannot be assumed, simply because Dr. Cain opines that the market for Credit Suisse ADSs is efficient. Rather, Dr. Cain must analyze the characteristics of each Credit Suisse Option to determine whether trading in that option series was consistent with market efficiency. Dr. Cain, however, has not done so.

B. Dr. Cain Has Not Performed an Analysis That Supports a Finding of Market Efficiency for Each Option Series on Credit Suisse ADSs

149. Dr. Cain purports to show an “additional relevant factor[]” in support of his conclusion by analyzing whether the prices of a small number of Credit Suisse Options—which tended to be the most liquid ones—moved “in a directionally consistent manner with price movements in the underlying Credit Suisse ADS” on days with statistically significant price changes in Credit Suisse ADSs based on his event study model.¹⁶⁶ As I will discuss below, however, his flawed analysis ignores hundreds of other Credit Suisse Options with distinct economic characteristics, which renders his conclusion unreliable.

150. Dr. Cain only analyzes two option series (one call and one put) on each day with a statistically significant change in the price of Credit Suisse ADSs, based on his event study. Specifically, he analyzes only option series that “(a) were the nearest to expiration, (b) had strike prices nearest the prior day’s closing ADS price, and (c) were in-the-money as of that prior day’s market close.”¹⁶⁷

151. In total, Dr. Cain analyzes 22 unique option series out of a total of 884 Credit Suisse Options series (2.5%) that traded during the Proposed Class Period, as shown in **Exhibit 18**.¹⁶⁸

¹⁶⁶ Cain Report, ¶¶ 104–106.

¹⁶⁷ Cain Report, ¶ 106.

¹⁶⁸ Dr. Cain analyzes one call option and one put option on each of the 12 days with statistically significant price changes in Credit Suisse ADSs, based on Dr. Cain’s event study model. This yields 24 option-day combinations. However, he analyzes the same call option series and put option series on both March 14, 2023 and March 15, 2023 (i.e., the two call options that he analyzes on March 14, 2023 and March 15, 2023 have the same strike price and expiration date, and the two put options that he analyzes

This exhibit includes a count of all unique Credit Suisse Options series that were tradable during the Proposed Class Period, a count of unique Credit Suisse Options series with trading activity during the Proposed Class Period, and a count of unique Credit Suisse Options series analyzed by Dr. Cain.

152. In drawing conclusions about the market efficiency of *all* Credit Suisse Options based on an analysis of only 2.5% of Credit Suisse Options, Dr. Cain effectively assumes that there is a single market for Credit Suisse Options. This assumption is unsupported. The Credit Suisse Options are not homogeneous securities, that is, each of the 884 Credit Suisse Options series that traded during the Proposed Class Period is a unique security, with differences in type of option (i.e. call vs. put), strike price, expiration date, and liquidity.¹⁶⁹ Each of the series of Credit Suisse Options therefore exhibits distinct economic characteristics, and they trade in distinct markets.

153. As Dr. Cain acknowledges, the price of an option is a function of multiple factors, “including how the current underlying security price compares to the exercise [or strike] price, the amount of time to expiration, anticipated dividends, expected volatility of the underlying stock, and interest rates.”¹⁷⁰ The impact of a change in the price of the stock would not be expected to have the same impact on the price of a corresponding option series with different strike prices or expiration dates.¹⁷¹ Thus, each option series with a unique combination of either call or put, expiration date, and strike price represents a unique security with distinct economic

on March 14, 2023 and March 15, 2023 also have the same strike price and expiration date). As a result, Dr Cain analyzes 22 unique option series in Exhibits 11A and 11B of the Cain Report. *See Cain Report, ¶ 106, Exhibits 11A, 11B.*

¹⁶⁹ *See Exhibit 18.*

¹⁷⁰ Cain Report, ¶ 98.

¹⁷¹ Consider a call option with a strike price that is well below the price of the stock. In this case, the value of the call option will move almost one to one with the stock price since it is unlikely the option will expire with no value. Conversely, when call option’s strike price is well above the price of the stock, it is relatively insensitive to price movements of the stock since it is unlikely that the option expires with positive value. As time to maturity decreases, there is less uncertainty about what the stock price will be at expiration. If an option is deeply in the money, it is unlikely that it will expire without any value when there is little time to maturity left. Hence, changes in its value will closely match changes in the underlying’s value. *See Hull (2022), p. 399 (“The delta (Δ) of an option...is defined as the rate of change of the option price with respect to the price of the underlying asset.”), pp. 331, 400–401 (“[I]t can be shown...that $\Delta(\text{call}) = N(d_1)$,” where d_1 is a function of strike price and time to expiration.), and Figure 19.4, which illustrates “[t]ypical patterns for variation of delta with time to maturity for a call option.”*

characteristics. Dr. Cain, however, fails to analyze market efficiency for the vast majority of Credit Suisse Options series.

154. Furthermore, the Credit Suisse Options analyzed by Dr. Cain are among the most liquid option series around the dates considered in his analysis. Liquidity, however, can vary substantially across options depending on how close the strike price is to the underlying stock price (called “moneyness”) and the option’s maturity, and liquidity can change substantially over time.¹⁷² Those that are nearest to expiry and with the strike price nearest to the stock price—the set Dr. Cain focuses on—tend to be the most actively traded.¹⁷³ Dr. Cain fails to explain how varying liquidity across Credit Suisse Options and throughout the Proposed Class Period might impact his conclusion that “the Credit Suisse Options traded in an efficient market throughout the [Proposed] Class Period.”¹⁷⁴

155. I first consider variation in liquidity across Credit Suisse Options. **Exhibit 19** shows the distribution of daily trading volume across Credit Suisse Options on the 11 dates analyzed in Exhibits 11A and 11B in the Cain Report that are in the Proposed Class Period. This exhibit separately summarizes the distribution of daily trading volume for all Credit Suisse Options series, option series analyzed by Dr. Cain, and option series not analyzed by Dr. Cain. As shown in this exhibit, Dr. Cain only analyzes 22 of the 740 Credit Suisse Options series that traded during the Proposed Class Period on these 11 dates. Further, this analysis confirms that the Credit Suisse Options series analyzed by Dr. Cain had relatively high trading volume on the dates in Dr. Cain’s analysis. For example, the median daily trading volume across the Credit

¹⁷² For example, Gârleanu, Pedersen, and Potoshman (2009) observe pricing anomalies for options as a result of limits to arbitrage. They further observe differences in market efficiency across options, due to the variation in demand across different option series. See Gârleanu, Nicolae, Lasse Heje Pedersen, and Allen M. Potoshman, “Demand-Based Option Pricing,” *Review of Financial Studies*, Vol. 22, No. 10, 2009, pp. 4259–4299 (“Gârleanu, Pedersen, and Potoshman (2009)”), at pp. 4279–4281.

¹⁷³ Easley, David, Maureen O’Hara, and P. S. Srinivas, “Option Volume and Stock Prices: Evidence on Where Informed Traders Trade,” *The Journal of Finance*, Vol. 53, No. 2, 1998, pp. 431–465, at p. 453 (“Trading in both puts and calls is largely concentrated in the near-to-maturity, closest-to-the-money contracts. More than 90 percent of active trading (more than 100 trades per day) occurs in call option series expiring in the current month or in the succeeding month. For puts, this fraction is over 98 percent, both in terms of transactions and volume.”); As of August 2023, options with over 30 days to expiry represented just 20% of daily volume on the S&P 500 Index. See Doar, Spencer, “The Evolution of Same Day Options Trading,” *Chicago Board Options Exchange*, August 3, 2023, available at <https://www.cboe.com/insights/posts/the-evolution-of-same-day-options-trading/>.

¹⁷⁴ Cain Report, ¶ 106.

Suisse Options series analyzed by Dr. Cain was 206 contracts, while the median daily trading volume for the Credit Suisse Options series not analyzed by Dr. Cain was 27 contracts.¹⁷⁵

156. In fact, Dr. Cain ignores that there were many Credit Suisse Options that had extremely limited trading on these dates. For example, more than 10% of Credit Suisse Options series that traded at some point during the Proposed Class Period did not trade at all on the 11 dates analyzed by Dr. Cain. Dr. Cain has not articulated how he could reliably apply his conclusion to such options.

157. Next, I consider variation in liquidity across time. **Exhibit 20** shows the distribution of daily trading volume across days in the Proposed Class Period. This exhibit separately summarizes the distribution of trading volume for all dates in the Proposed Class Period, dates analyzed in Exhibits 11A and 11B of the Cain Report that are in the Proposed Class Period, and dates not analyzed in Exhibits 11A and 11B of the Cain Report that are in the Proposed Class Period. As shown in this exhibit, Dr. Cain only analyzes 11 days out of the 97 trading days in the Proposed Class Period. Further, this analysis shows that the dates analyzed by Dr. Cain had relatively high trading volume. For example, the median total daily trading volume for all Credit Suisse Options on days analyzed by Dr. Cain in the Proposed Class Period was 28,051 contracts, more than double the median total daily trading volume on days in the Proposed Class Period not analyzed by Dr. Cain, which was 12,973 contracts.

158. In summary, Dr. Cain's analysis of a small, selected set of options is flawed, ignoring the distinct characteristics and market conditions across option series and over time, which renders his conclusion unreliable.

C. Dr. Cain's Analysis of the Price Movements of Credit Suisse Options Does Not Reliably Support a Conclusion of Market Efficiency

159. As described above, Dr. Cain's analysis of option price movements does not include 97.5% of Credit Suisse Options series that traded during the Proposed Class Period. Additionally, even for the 2.5% of Credit Suisse Options series that he does analyze, his analysis does not reliably support his conclusion of market efficiency. As I explain in this section, Dr.

¹⁷⁵ The mean daily trading volume across the Credit Suisse Options analyzed by Dr. Cain was 538 versus 415 for the Credit Suisse Options not analyzed by Dr. Cain. See **Exhibit 19**.

Cain does not offer any academic literature or other evidence as support for how his analysis demonstrates that the Credit Suisse Options traded in efficient markets.

160. Specifically, in Exhibits 11A and 11B of the Cain Report, Dr. Cain evaluates “whether the prices of Credit Suisse Options tended to move in a directionally consistent manner with the price movements in the underlying Credit Suisse ADS.”¹⁷⁶ As I explain above, Dr. Cain analyzes the movement in price for only two option series (one call and one put) on each day with a statistically significant change in the price of Credit Suisse ADS, based on his event study.¹⁷⁷ He observes that the price movements for 11 out of the 12 option-day combinations for the call options that he analyzes and 11 out of the 12 option-day combinations for the put options that he analyzes “were directionally consistent with the underlying Credit Suisse ADS price movements.”¹⁷⁸ Dr. Cain then concludes that “[t]his finding provides further support for the conclusion that the Credit Suisse Options traded in an efficient market throughout the [Proposed] Class Period.”¹⁷⁹

161. Dr. Cain’s analysis of option price movements does not reliably support his conclusion of market efficiency. First, Dr. Cain offers no evidence that the mere fact that the movement of stock and option prices are in the same direction can demonstrate market efficiency for options. Dr. Cain cites to no peer-reviewed finance academic literature or other authority to support this approach as a reliable method to analyze market efficiency.¹⁸⁰

162. Second, Dr. Cain’s analysis of options is very different from his analysis for ADS in that he focuses on the *direction* of changes in option prices without testing whether the results are statistically meaningful.¹⁸¹ Unlike with Credit Suisse ADSs, Dr. Cain has not conducted an event study for Credit Suisse Options. He therefore has no reliable basis to conclude that the changes in option prices in Exhibits 11A or 11B of the Cain Report are *different from zero* as a statistical matter.

163. Nor has Dr. Cain analyzed whether the magnitude of the price movement for each Credit Suisse Option series is indeed consistent with what one would expect had the options traded in

¹⁷⁶ Cain Report, ¶ 105.

¹⁷⁷ Cain Report, ¶ 106.

¹⁷⁸ Cain Report, ¶ 106, Exhibits 11A, 11B.

¹⁷⁹ Cain Report, ¶ 106.

¹⁸⁰ Dr. Cain cites no support in Section VI.D of the Cain Report.

¹⁸¹ Cain Report, ¶ 105.

efficient markets, accounting for both (i) the magnitude of the corresponding change in the price of Credit Suisse ADS and (ii) the economic characteristics of the Credit Suisse Options series.

Dr. Cain acknowledges that “[o]ption valuation models, such as the Black-Scholes model, depend directly on the current underlying stock price,”¹⁸² but does nothing to check whether option price changes were consistent with what such option valuation models would predict given the magnitude of ADS price changes. For the one day where the option price return had a different sign from the ADS return, March 15, 2023, Dr. Cain has not explained why this discrepancy exists or its significance.

164. In summary, Dr. Cain has failed to present any analysis supported by academic literature to show that the prices of the 22 analyzed Credit Suisse Options series responded to value-relevant information during the Proposed Class Period in a way consistent with what one may expect in efficient markets. For this reason as well, Dr. Cain’s analysis of option price movements does not support a conclusion of market efficiency for the Credit Suisse Options.

D. Dr. Cain Ignores That High Option Bid-Ask Spreads and Low Option Trading Volumes Have Implications for Market Efficiency

165. Dr. Cain analyzes the *Cammer* and *Krogman* factors for both Credit Suisse ADSs and Notes; however, he dismisses these factors and opines that these factors “are not directly applicable to options.”¹⁸³

166. As part of his analysis of these factors, he specifically dismisses trading volume and bid-ask spread. Regarding trading volume, Dr. Cain states that “options can be created, or ‘written’ in unlimited quantities.”¹⁸⁴ He concludes that “[a]s a result, the ability for investor to buy or sell options is not limited by the amount of trading volume in a given option series.”¹⁸⁵ Regarding bid-ask spread, Dr. Cain opines that “[o]ption prices are generally lower than the current trading prices of the underlying security, which causes the bid-ask spread to be wider as a percentage of the option prices.”¹⁸⁶ He also notes that “[o]ptions are also traded less frequently” and concludes

¹⁸² Cain Report, fn. 112.

¹⁸³ Cain Report, ¶ 103.

¹⁸⁴ Cain Report, ¶ 103.a.

¹⁸⁵ Cain Report, ¶ 103.a.

¹⁸⁶ Cain Report, ¶ 103.g.

that “[a]s a result, the bid-ask spreads of equity securities are not comparable to the bid-ask spreads of options.”¹⁸⁷

167. Dr. Cain ignores evidence from academic literature that inefficient trading in options is associated with high transaction costs and margin requirements and thus high bid-ask spreads, as I discuss above.¹⁸⁸ He also ignores evidence that these factors are also correlated with low trading volume. For example, a study by Mayhew (2002) finds that higher bid-ask spreads are correlated with lower trading volume for options: “[b]id-ask spreads on options are ... negatively related to trading volume.”¹⁸⁹ Both bid-ask spreads and trading volume are therefore relevant for assessing potential “limits to arbitrage” and thus market efficiency for options.

168. Dr. Cain fails to consider how his finding of market efficiency for Credit Suisse Options can be reconciled with observed high bid-ask spreads and low trading volume for the Credit Suisse Options.

169. For example, Credit Suisse Options, both those analyzed by Dr. Cain and those not analyzed, exhibit high bid-ask spreads. **Exhibit 21** presents the distribution of bid-ask spreads across Credit Suisse Options series during the Proposed Class Period. The median bid-ask spread across all Credit Suisse Options series during the Proposed Class Period was 24.5% while the 10th to 90th percentile spans 7.8%–79.6%. In comparison, Dr. Cain benchmarks the bid-ask spread for Credit Suisse ADSs against a paper that calculates a median bid-ask spread of 1.69% for firms covered by securities analysts.¹⁹⁰

170. Additionally, most of the Credit Suisse Options traded infrequently during the Proposed Class Period. **Exhibit 22** presents the distribution of the percentage of days with zero trading volume for Credit Suisse Options series during the Proposed Class Period. The median Credit Suisse Option series that traded at some point during the Proposed Class Period did not trade on 70.1% of all possible trading days during the Proposed Class Period. As mentioned above, Dr.

¹⁸⁷ Cain Report, ¶ 103.g.

¹⁸⁸ See Cao and Han (2013), p. 241; Santa-Clara and Saretto (2009), p. 393.

¹⁸⁹ Mayhew, Stewart, “Competition, Market Structure, and Bid-Ask Spreads in Stock Option Markets,” *The Journal of Finance*, Vol. 57, No. 2, 2002, pp. 931–958 (“Mayhew (2002)”), at p. 932. See also George, Thomas J., and Francis A. Longstaff, “Bid-Ask Spreads and Trading Activity in the S&P 100 Index Options Market,” *Journal of Financial and Quantitative Analysis*, Vol. 29, No. 3, 1993, pp. 381–387, at p. 392 (“[T]he level of trading activity is also an important factor of bid-ask spreads...bid-ask spreads are smaller for options with greater trading activity.”).

¹⁹⁰ Cain Report, ¶ 90 (“By way of comparison, the MRK Study found that the MRK Sample firms had a median bid-ask spread of 4.55%, while the MRK Covered firms had a median bid-ask spread of 1.69%”).

Cain focuses on more liquid options. Even the median among the set of Credit Suisse Options series that Dr. Cain analyzes, however, did not trade on 22.9% of all trading days during the Proposed Class Period.

171. The Credit Suisse Options therefore exhibit high bid-ask spread and low trading volume. Dr. Cain fails to consider how his conclusion of market efficiency for Credit Suisse Options is consistent with this market evidence. Dr. Cain dismisses these factors, despite the fact that academic literature indicates that both bid-ask spread and trading volume are relevant for assessing limits to arbitrage, and thus also market efficiency, for options.

X. Dr. Cain Fails to Reliably Demonstrate That the Credit Suisse Notes Traded in Efficient Markets During the Proposed Class Period

172. Dr. Cain conducts a market efficiency analysis for the Credit Suisse Notes, opining that the “Credit Suisse Notes traded in efficient markets throughout the [Proposed] Class Period.”¹⁹¹ As support for this finding, as he does for the Credit Suisse ADSs, Dr. Cain examines the *Cammer* and *Krogman* factors.¹⁹² As I discuss in detail below, Dr. Cain’s analyses are flawed, and therefore fail to demonstrate that the Credit Suisse Notes traded in efficient markets during the Proposed Class Period.

173. First, as discussed in **Section X.A**, Dr. Cain’s analysis of *Cammer* Factor 5 for the Credit Suisse Notes is flawed and unreliable. Specifically, Dr. Cain reaches unsupported conclusions about market efficiency based on only two, arbitrarily selected “news days”: one that is not even in the Proposed Class Period, and the other a day on which none of the Credit Suisse Notes had a statistically significant residual price return. He also inappropriately pools all Credit Suisse Notes together despite each note representing a distinct security with different economic characteristics. Second, as discussed in **Section X.B**, Dr. Cain’s analyses of *Cammer* Factor 1 (trading volume) and *Krogman* Factor 2 (bid-ask spread) are also flawed.

¹⁹¹ Cain Report, ¶ 3.c.

¹⁹² Cain Report, ¶ 3.b.

A. Dr. Cain’s *Cammer Factor 5* Analysis for the Credit Suisse Notes Is Flawed and Unreliable

174. Dr. Cain relies on an event study analysis to evaluate the price movements of the Credit Suisse Notes as part of his *Cammer Factor 5* analysis.¹⁹³ Specifically, Dr. Cain analyzes the residual returns on two days with purportedly value-relevant news for the Credit Suisse Notes (the “Notes News Days”) versus other trading days (the “Notes No-News Trading Days”) by aggregating all seven Credit Suisse Notes together.¹⁹⁴ Based on this analysis, Dr. Cain concludes that “[t]hese findings establish a clear cause-and-effect relationship between new Company-specific information and price movements in the Credit Suisse Notes.”¹⁹⁵ According to Dr. Cain, this finding “supports the conclusion that Credit Suisse Notes traded in efficient markets during the [Proposed] Class Period.”¹⁹⁶ Dr. Cain’s *Cammer Factor 5* analysis, however, is flawed, rendering his conclusion unreliable.

175. Dr. Cain’s event study analysis for the Credit Suisse Notes uses “the same methodology as the ADS Event Study, with a few differences.”¹⁹⁷ Specifically, Dr. Cain first estimates the relationship between each Credit Suisse Note’s daily returns and the returns of an equity market index, an equity industry index, changes in the 10-year U.S. Treasury Note, and returns of the S&P U.S. Investment Grade Corporate Bond Index.¹⁹⁸ Dr. Cain then pools all Credit Suisse Notes together and compares the price reactions and trading volume on two event dates: November 2, 2022 and March 20, 2023 (collectively, the Notes News Days).¹⁹⁹ November 2, 2022 represents the first trading day after “S&P and Moody’s downgraded some of Credit

¹⁹³ Cain Report, ¶ 153.

¹⁹⁴ Cain Report, ¶¶ 160–162, footnote 221.

¹⁹⁵ Cain Report, ¶ 164.

¹⁹⁶ Cain Report, ¶ 164.

¹⁹⁷ Cain Report, ¶ 153.

¹⁹⁸ Cain Report, ¶ 153. Dr. Cain uses a rolling estimation period of 120 trading days for six out of the seven Credit Suisse Notes. The 22550L2M2 note was issued after the start of the Proposed Class Period. As a result, Dr. Cain uses a fixed estimation period of January 5, 2023 through March 20, 2023 for the 22550L2M2 note. Dr. Cain only includes single-day returns (i.e., returns over two consecutive trading days) in his Note Event Study. See Cain Report, ¶¶ 154, 155, footnotes 213, 215.

¹⁹⁹ Cain Report, ¶¶ 160–162, Exhibits 17–18.

Suisse's debt.”²⁰⁰ March 20, 2023 represents the first trading day after the announcement of the merger between Credit Suisse and UBS.²⁰¹

176. First, Dr. Cain's event study analysis is flawed and unreliable as it is based on only two event dates, one of which is after the end of the Proposed Class Period.²⁰² For the only Notes News Day within the Proposed Class Period (i.e., November 2, 2022), *none* of the Credit Suisse Notes has a statistically significant residual return.²⁰³ That is, *none* of the Credit Suisse Notes had a statistically significant price change during any Notes News Days during the Proposed Class Period. Dr. Cain thus has no reliable basis for his conclusion of a “clear cause-and-effect relationship” between Company-specific information and the prices of Credit Suisse Notes during the Proposed Class Period.²⁰⁴

177. Second, Dr. Cain's selection of Notes News Days is flawed and unscientific. Dr. Cain's identification of Notes News Days is purportedly based on two types of information that represent “important factor[s] in the valuation of corporate bonds”: information about credit rating and change in control.²⁰⁵ Dr. Cain cites to no academic literature or other authority to support his methodology for only focusing on these two types of news to represent “important factor[s] in the valuation of corporate bonds.”²⁰⁶ Many economic factors, however, could impact the likelihood that a bank defaults on its debt, including but not limited to its profitability, liquidity, and capital adequacy.²⁰⁷ Given this, Dr. Cain's choice of Notes News Days is *ad hoc* and unscientific, and thus his analysis based on this flawed set of Notes News Days is unreliable.

²⁰⁰ Cain Report ¶ 160, footnote 219.

²⁰¹ Cain Report, ¶ 160, footnote 220.

²⁰² Cain Report, ¶ 160.

²⁰³ Cain Report, ¶ 160, Exhibit 17.

²⁰⁴ Cain Report, ¶ 164.

²⁰⁵ Cain Report, ¶¶ 158–159.

²⁰⁶ Cain Report, ¶ 159.

²⁰⁷ As an example, academic literature suggests that deposit outflows can lead to financial distress in a bank run. *See, e.g.*, Diamond, Douglas W., and Philip H. Dybvig, “Bank Runs, Deposit Insurance, and Liquidity,” *Journal of Political Economy*, Vol. 91, No. 3, 1983, pp. 401–419, at p. 401 (“During a bank run, depositors rush to withdraw their deposits because they expect the bank to fail. In fact, the sudden withdrawals can force the bank to liquidate many of its assets at a loss and to fail.”); Goldstein, Itay, and Ady Pauzner, “Demand-Deposit Contracts and the Probability of Bank Runs,” *The Journal of Finance*, Vol. 60, No. 3, 2005, pp. 1293–1327, at pp. 1293–1294 (“The maturity mismatch between assets and liabilities makes banks inherently unstable by exposing them to the possibility of panic-based bank runs ... As a result, the bank is forced to liquidate its long-term investments at a loss and indeed fails.”). *See also* Chen, Qi, et al., “Liquidity Transformation and Fragility in the U.S. Banking Sector,” *The Journal of*

178. Third, Dr. Cain inappropriately pools the Credit Suisse Notes together for his *Cammer* Factor 5 analysis. The Credit Suisse Notes are not homogeneous securities, that is, each of the seven Credit Suisse Notes is a unique security, with differences in original amount issued, coupon rate, maturity, and liquidity, among other features.²⁰⁸ Each of the Credit Suisse Notes therefore exhibits distinct economic characteristics and is traded in a distinct market. Company-specific information would not be expected to have the same impact on the price of two different Credit Suisse Notes, given different coupons, maturity dates, and liquidity profiles. Dr. Cain fails to account for the possibility that some of the Credit Suisse Notes could be traded in efficient markets, while the others may not. By pooling all the Credit Suisse Notes together in his analysis of price changes on Notes News Days versus Notes No-News Trading Days, Dr. Cain fails to analyze the cause-and-effect relationship for each of the seven distinct Credit Suisse Notes.

179. Further, Dr. Cain's pooling technique for the Credit Suisse Notes raises methodological issues that Dr. Cain does not address. For example, Dr. Cain's pooling methodology implicitly and incorrectly assumes, from a statistical perspective, that the price reaction for each of the Credit Suisse Notes is *independent* from (and therefore uncorrelated with) the price reactions of the other Credit Suisse Notes on the same day. Price responses across Credit Suisse Notes, however, are likely correlated when the event date is the same. Dr. Cain's event study methodology for the Credit Suisse Notes is therefore flawed and does not reliably support his conclusion that the Credit Suisse Notes traded in efficient markets during the Proposed Class Period.²⁰⁹

Finance, Vol. 79, No. 6, 2024, pp. 3985–4036, who provide empirical evidence of the theoretical mechanisms described above.

²⁰⁸ See **Exhibit 1**.

²⁰⁹ Dr. Cain also does not form an *ex ante* hypothesis for the direction of expected price movements. Rather, he only tests the extent to which the magnitude of the residual return can be distinguished from zero, not whether the direction of the residual return is consistent with expectations. This is particularly important on March 20, 2023 when the price of Credit Suisse ADS and the price of Credit Suisse Notes move in opposite directions: the residual return on the ADS is negative while the residual return on the Notes is positive. A “cause-and-effect relationship between Company disclosures and resulting movements in the prices of the Credit Suisse Notes” may not exist if the direction of the price movements is inconsistent with *ex ante* expectations. Dr. Cain has not assessed whether this is the case for March 20, 2023. See Cain Report, ¶ 158, Exhibit 17.

B. Dr. Cain’s Analysis of *Cammer* Factor 1 and *Krogman* Factor 2 Are Both Flawed

180. As explained in this section, Dr. Cain’s analysis of *Cammer* Factor 1 and *Krogman* Factor 2 are both flawed.

181. Dr. Cain evaluates the weekly trading volume for the Credit Suisse Notes as part of his *Cammer* Factor 1 analysis.²¹⁰ Specifically, Dr. Cain states that the average weekly trading volume of the Credit Suisse Notes “ranged from 0.6% to 4.8% for each of the Credit Suisse Notes” during the Proposed Class Period and compares these levels of trading volume to the 1% threshold described by the *Cammer* court.²¹¹ Dr. Cain also analyzes the trading frequency of the Credit Suisse Notes and benchmarks those against figures from one academic study.²¹² Dr. Cain concludes that “the levels of trading volume in the Credit Suisse Notes throughout the [Proposed] Class Period provide[] strong support for the conclusion that the Credit Suisse Notes traded in efficient markets.”²¹³ Dr. Cain’s analysis of trading volume and frequency, however, is incomplete and unreliable.

182. First, Dr. Cain fails to acknowledge that at least two of the Credit Suisse Notes do not satisfy the trading volume benchmark that he cites as relevant for assessing market efficiency. As Dr. Cain notes, “an average weekly turnover of greater than 1% ‘would justify a substantial presumption’ that the markets for the Credit Suisse Notes were efficient” according to *Cammer v. Bloom*.²¹⁴ Two of the seven Credit Suisse Notes, however, do not satisfy this threshold (225433AC5 has an average weekly trading volume of 0.8% and 225433AF8 has an average weekly trading volume of 0.6%).²¹⁵ As discussed previously, each of the Credit Suisse Notes is

²¹⁰ Cain Report, ¶¶ 134–135.

²¹¹ Cain Report, ¶¶ 134–135.

²¹² Cain Report, ¶¶ 136–137, Exhibit 14.

²¹³ Cain Report, ¶ 138.

²¹⁴ Cain Report, ¶ 135.

²¹⁵ Cain Report, Exhibit 13, ¶ 135 (“According to the *Cammer* court, an average weekly turnover of greater than 1% ‘would justify a substantial presumption’ that the markets for the Credit Suisse Notes were efficient. Of the seven Credit Suisse Notes, five justify a substantial presumption. While there are two Credit Suisse Notes that fall below this threshold, the average weekly trading volume for these two Credit Suisse Notes is just slightly below 1%, and, as a result, does not by itself mean that these two Credit Suisse Notes traded in an inefficient market during the [Proposed] Class Period.”). Consistent with the Cain Report, the reported average weekly trading volume figures exclude the last week of the Proposed Class Period.

an individual security with specific economic and market characteristics, and Dr. Cain fails to explain how the trading volumes of these two Notes could “justify a substantial presumption” of market efficiency.

183. Second, Dr. Cain attempts to show that the trading frequency of the Credit Suisse Notes (i.e., the number of days with trading activity) during the Proposed Class Period is higher than that of the bonds identified in a study by Goldstein and Hotchkiss (2020).²¹⁶ Dr. Cain does not show, however, that the bonds in Goldstein and Hotchkiss (2020) are reasonable benchmarks for assessing the market efficiency of the Credit Suisse Notes during the Proposed Class Period. For example, Goldstein and Hotchkiss (2020) do not assess market efficiency for any security, and Dr. Cain fails to explain why the statistics provided in Goldstein and Hotchkiss (2020) serve as benchmarks or thresholds for assessing market efficiency.²¹⁷

184. Finally, Dr. Cain evaluates the bid-ask spread for the Credit Suisse Notes as part of his *Krogman Factor 2* analysis.²¹⁸ Specifically, Dr. Cain calculates that “the mean percentage bid-ask spreads for each of the Credit Suisse Notes during the [Proposed] Class Period ranges from 0.09% to 1.06%” and the median “ranges from 0.10% to 0.99%.”²¹⁹ Dr. Cain benchmarks these figures against one academic study and concludes that the “narrow bid-ask spreads of Credit Suisse Notes support the conclusion that the Credit Suisse Notes traded in efficient markets.”²²⁰ Dr. Cain’s analysis of bid-ask spread is, however, flawed and unreliable.

185. Dr. Cain compares the bid-ask spread of the Credit Suisse Notes with median bid-ask spreads reported in a 2013 study by Mola, Rau, and Khorana (the “MRK Study”).²²¹ Dr. Cain does not show, though, that the statistics provided in the MRK Study are reasonable benchmarks

²¹⁶ Cain Report, ¶¶ 136–137 (“Goldstein and Hotchkiss find that the mean and median number of days per month with at least one bond trade is 6.3 days and 4.5 days, respectively, for bonds in the top 50% of trading activity by frequency (deciles 6-10) when analyzing 55,988 bonds. The values, 6.3 days and 4.5 days, equate to 30.0% and 21.4% of a month, respectively. Exhibit 14 shows that the trading frequency of each of the Credit Suisse Notes was much higher than of the bonds in the Goldstein and Hotchkiss study.”).

²¹⁷ Goldstein, Michael A., and Edith S. Hotchkiss, “Providing Liquidity in an Illiquid Market: Dealer Behavior in US Corporate Bonds,” *Journal of Financial Economics*, Vol. 135, 2020, pp. 16–40 (“Goldstein and Hotchkiss (2020)”), at p. 21 (“This study uses data provided by the Financial Industry Regulatory Authority (FINRA) for all corporate bonds reported to TRACE from July 8, 2002 through March 31, 2011.”).

²¹⁸ Cain Report, ¶ 168.

²¹⁹ Cain Report, ¶ 170.

²²⁰ Cain Report, ¶ 170.

²²¹ Cain Report, ¶ 170.

for mean and median bid-ask spread of the Credit Suisse Notes during the Proposed Class Period. For example, the MRK Study does not assess market efficiency for any security, and Dr. Cain fails to explain why the statistics provided in the MRK Study serve as benchmarks or thresholds for assessing market efficiency.²²²

Executed this 17th of January, 2025



Mark Garmaise, Ph.D.

²²² Mola, Simona, P. Raghavendra Rau, and Ajay Khorana, “Is There Life After the Complete Loss of Analyst Coverage?” *The Accounting Review*, Vol. 88, No. 2, 2013, pp. 667–705 (“MRK Study”).

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ACADEMIC EMPLOYMENT

<i>Joel Fried Chair in Applied Finance</i>	UCLA Anderson, 2023-present.
<i>Professor of Finance</i>	UCLA Anderson, 2014-present.
<i>Robert D. Beyer '83 Term Chair in Management</i>	UCLA Anderson, 2015-2018.
<i>Area Head, Finance</i>	UCLA Anderson, 2016-2018.
<i>Senior Associate Dean, Full Time MBA Program</i>	UCLA Anderson, 2014-2015.
<i>Associate Professor of Finance (with tenure)</i>	UCLA Anderson, 2008-2014.
<i>Assistant Professor of Finance</i>	UCLA Anderson, 2002-2008.
<i>Visiting Assistant Professor of Finance</i>	UCLA Anderson, 2001- 2002.
<i>Assistant Professor of Finance</i>	University of Chicago, 1998- 2002.

EDUCATION

Stanford University, Graduate School of Business
Ph.D. degree in Finance, June 1998.

Harvard College
Bachelor of Arts degree, Magna Cum Laude, in Mathematics and Philosophy, 1994.

RESEARCH INTERESTS

Corporate Finance
Real Estate
Entrepreneurship
Banking

PEER REVIEWED JOURNAL ARTICLES PUBLISHED

Garmaise, Mark J., "Rational Beliefs and Security Design," *Review of Financial Studies*, Winter 2001, 14.4, pp. 1183-1213.

Garmaise, Mark J., and Tobias Moskowitz, "Informal Financial Networks: Theory and Evidence," *Review of Financial Studies*, Winter 2003, 16.4, pp. 1007-1040. Granted the *Barclays Global Investor/ Michael Brennan Award* for the best paper published in Vol. 16 of the *Review of Financial Studies*.

Garmaise, Mark J., and Tobias Moskowitz, "Confronting Information Asymmetries: Evidence from Real Estate Markets," *Review of Financial Studies*, Summer 2004, 17.2, pp. 405-437. Granted the *Barclays Global Investor/Michael Brennan Runner-Up Award* for the best paper published in Vol. 17 of the *Review of Financial Studies*.

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Garmaise, Mark J., and Gabriel Natividad, "Spillovers in Local Banking Markets," *Review of Corporate Finance Studies*, Volume 5, Issue 2, September 2016, pp. 139-165. Editor's Choice article. Granted the Best Paper Award in 2017 for the *Review of Corporate Finance Studies*.

Garmaise, Mark J., and Gabriel Natividad, "Consumer Default, Credit Reporting and Borrowing Constraints," *Journal of Finance*, Volume 72, Number 5, October 2017, pp. 2331-2368.

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Garmaise, Mark J., "Alternative mortgage contracts and affordability- overview." *Regional Science and Urban Economics*, January 2020, 103386.

WORKING PAPERS

"Intermediary Profits in a Time of Scarcity," (with Mark Jansen and Jason Snyder), working paper, UCLA Anderson.

"Collateral Damage: Low-Income Borrowers Depend on Cash Flow-Based Lending," (with Mark Jansen and Adam Winegar), working paper, UCLA Anderson.

"Reducing Leverage While Increasing Delinquency Risk," (with Erik Berwart, Mauricio Larrain, Gabriel Natividad and Patricio Valenzuela), working paper, UCLA Anderson.

"Corruption, Firm Governance and the Cost of Capital," (with Jun Liu), working paper, UCLA Anderson.

"Informed Investors and the Financing of Entrepreneurial Projects," working paper, UCLA Anderson.

SYNERGISTIC ACTIVITIES

Associate Editor, *Journal of Law, Finance and Accounting*, 2015-present.

Associate Editor, *Review of Financial Studies*, 2002-2005.

American Finance Association Nominating Committee, 2007.

Referee for the *Journal of Finance*, *Review of Financial Studies*, *Journal of Financial Economics*, *Journal of Political Economy*, *Review of Economic Studies*, *Journal of Economic Behavior and Organization*, *Journal of Law, Economics and Organization*, 1998-present.

AWARDS

Cátedra Renzo Rossini (Renzo Rossini Chair Award), 2023.

Executive MBA Teaching Excellence Award, 2018.

Neidorf Decade Teaching Award, 2012.

Full-time MBA Teaching Excellence Award, 2011.

Fully Employed MBA Teaching Excellence Award, 2009.

Citibank Teaching Award for Most Outstanding MBA teacher, 2007.

Eric and "E" Juline Faculty Excellence in Research Award, 2006.

Dean George W. Robbins Assistant Professor Teaching Award, 2005.

TEACHING EXPERIENCE

Assistant, Associate and Full Professor. UCLA Anderson, Autumn 2001-present.
Venture Capital, Corporate Finance: campus and evening MBA programs, MFE program.

Assistant Professor. University of Chicago, Autumn 1998-2001.
Corporation Finance: campus, evening and executive programs.

**Testimony Experience of Mark J. Garmaise, Ph.D.
Since 2020**

- 1. Alameda County Employees' Retirement Association, et. al. v. Portola Pharmaceuticals, Inc., et al., No. 3:20-cv-00367-VC (N.D. Cal.)**

I was retained by Portola Pharmaceuticals, Inc. and individual employee defendants. I filed an expert report, and I was deposed in May 2022.

- 2. Valeant Pharmaceuticals International, Inc. Securities Litigation, No. 3:18-cv-00343 (D.N.J.)**

I was retained by Valeant Pharmaceuticals International Inc. I filed an expert report, and I was deposed in June 2022.

- 3. Sheet Metal Workers' Nat'l Pension Fund, et al. v. Bayer AG, et al., No. 3:20-cv-04737-RS (N.D. Cal.)**

I was retained by Bayer AG. I filed two expert reports, and I was deposed in March 2023 and November 2024.

- 4. JFF Cecilia LLC, both in its individual capacity and derivatively on behalf of ADG Scotia Holdings, LLC; and Suffolk Construction Company, Inc. v. Weiner Ventures, LLC; Stephen R. Weiner; and Adam J. Weiner (Defendants); and ADG Scotia Holdings, LLC (Nominal Defendant), Civil Action No. 1984CV03317-BLS2 (Massachusetts Superior Court, Suffolk County)**

I was retained by Defendants. I filed an expert report, and I was deposed in August 2023.

- 5. Steamship Trade Association of Baltimore – International Longshoremen's Association Pension Fund, Individually and on Behalf of All Others Similarly Situated v. Olo Inc., et. al., No. 1:22-cv-08228-JSR (S.D. NY)**

I was retained by Defendants. I filed an expert report, and I was deposed in December 2023.

- 6. Carl Shupe, et al. vs. Rocket Companies, Inc., et al., No. 1:21-cv-11528 (E.D. Mich.)**

I was retained by Defendants. I filed two expert reports, and I was deposed in January and June 2024.

7. **In re Rocket Companies, Inc. Stockholder Derivative Litigation, No. 2021-1021-KSJM (Delaware Chancery Court)**

I was retained by Defendants. I filed an expert report, I was deposed in April 2024, and testified at trial in May 2024.

Documents Considered

Academic Literature and Textbooks

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- Beaver, William H., Maureen F. McNichols, and Zach Z. Wang, “Increased Market Response to Earnings Announcements in the 21st Century: An Empirical Investigation,” *Journal of Accounting and Economics*, Vol. 69, No. 1, 2020
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- “It’s a Debt Thing,” Bank of America, October 21, 2022
- “Credit Suisse Group AG,” CFRA, October 22, 2022
- “Stormy Weather,” Autonomous, October 27, 2022
- “Credit Suisse 3Q22 Call: 4 Autonobites,” Autonomous, October 27, 2022
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- “Solving for the Balance Sheet,” Bank of America, October 27, 2022
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- “Credit Suisse Group AG,” CFRA, October 27, 2022
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- “New Strategy and Capital Raise Announced,” Deutsche Bank, October 27, 2022
- “Saudi National Bank (1180.SE): to Acquire 9.99% Stake in Credit Suisse,” Goldman Sachs, October 27, 2022
- “Credit Suisse (CSGN.S): Strategy Update and Transformation plan,” Goldman Sachs, October 27, 2022
- “First Take on 3Q22 Results & New Strategy,” Jefferies, October 27, 2022
- “AT1 Screening Cheap Versus European Bank Equity and USD Preferred,” J.P. Morgan, October 27, 2022
- “First Take: Capital Raise Dilution -24% Leading to Exit P/E 6.4x 2024E, Await Further IB Restructuring Details,” J.P. Morgan, October 27, 2022
- “Upgrade To Overweight,” J.P. Morgan, October 27, 2022
- “Capital Raise Confirmed,” KBW, October 27, 2022
- “Change at a Hefty Price,” Kepler Cheuvreux, October 27, 2022
- “Key Takeaways from Strategic Update Conference Call,” Kepler Cheuvreux, October 27, 2022

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- “Decisive Actions Announced - First Thoughts,” UBS, October 27, 2022
- “Q322 Results, Strategy, Capital - Initial Feedback,” Barclays, October 28, 2022
- “Trade Idea: Value In Short-Call AT1 And Short-End HoldCo Senior,” J.P. Morgan, October 28, 2022
- “A ‘Show Me’ Stock Post Complex Restructuring Announcement: Neutral at 0.3x TBV 2022E,” J.P. Morgan, October 28, 2022
- “Long Road...Low Reward?” Kepler Cheuvreux, October 28, 2022
- “Credit Suisse Dilutive Rights Issue and Subpar Profitability Targets: Make Material Cut To Our FVE,” Morningstar, October 28, 2022, 12:50 UTC
- “Credit Suisse Dilutive Rights Issue and Subpar Profitability Targets: Make Material Cut To Our FVE,” Morningstar, October 28, 2022, 12:52 UTC
- “Embarking on a Journey Towards a Capital-Light and Less Volatile Business,” ODDO BHF, October 28, 2022
- “Negative Market Reaction - Our Assessment,” UBS, October 28, 2022
- “Credit Suisse Group AG,” CFRA, October 29, 2022
- “Extension Compulsion,” Bank of America, October 31, 2022
- “Hold: Strategy Update Fails to Convince,” HSBC, October 31, 2022
- “Terms of Capital Increase - 27% Economic Earnings Dilution,” J.P. Morgan, October 31, 2022
- “Credit Suisse Group AG ADR: Credit Suisse Dilutive Rights Issue and Subpar Profitability Targets: Make Material Cut to Our FVE,” Morningstar, November 1, 2022
- “Credit Suisse Group AG,” CFRA, November 2, 2022
- “Credit Suisse (CSGN.S): Updating Forecasts Post Strategy Update,” Goldman Sachs, November 2, 2022
- “Credit Suisse Dilutive Rights Issue and Subpar Profitability Targets: Make Material Cut To Our FVE,” Morningstar, November 2, 2022
- “Devil in the Detail,” Autonomous, November 3, 2022
- “Q3 2022: DTA Impairments and Poor Investment Bank Revenue Lead to Large Losses,” Moody’s, November 3, 2022
- “Analysis for NYSE: CS,” Trefis, November 4, 2022
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- “Update Following Rating Action,” Moody’s, November 9, 2022
- “2025 Plan: Breadth and Complexity of Restructuring Entail Significant Execution Risks,” Moody’s, November 10, 2022

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- “Restarting Coverage with Updated Numbers,” BNP Paribas, December 20, 2022
- “Making Sense of the New RoTE Target,” Citigroup, December 20, 2022
- “Uncertainty Ahead,” Kepler Cheuvreux, December 20, 2022
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Note: In addition to the documents on this list, I considered all documents cited in my report and my exhibits to form my opinions.

Summary of Credit Suisse Notes

(\$ in Millions)

CUSIP	Issuer	Issuance Date	Original Amount Issued	Maturity Date	Coupon	S&P Global / Moody's Ratings	
						Pre-Class Rating ^[1]	Post-Class Rating ^[2]
22541LAE3	Credit Suisse (USA), Inc.	7/19/02	\$1,000	7/15/32	7.125%	A / A2	A- / A3
225433AC5	Credit Suisse Group Funding (Guernsey) Limited	1/14/16	\$2,500	3/26/25	3.750%	BBB / Baa2	BBB- / Baa2
225433AF8	Credit Suisse Group Funding (Guernsey) Limited	1/14/16	\$2,000	5/15/45	4.875%	BBB / Baa2	BBB- / Baa2
22550L2E0	Credit Suisse AG	2/2/21	\$1,000	2/2/24	0.495%	A / A2	A- / A3
22550L2G5	Credit Suisse AG	8/9/21	\$1,750	8/7/26	1.250%	A / A2	A- / A3
22550L2K6	Credit Suisse AG	8/23/22	\$1,250	7/9/27	5.000%	A / A2	A- / A3
22550L2M2	Credit Suisse AG	1/9/23	\$2,500	2/15/28	7.500%		A- / A3

Source: Cain Report; Credit Suisse SEC Forms 424B2, 424B3, and FWP

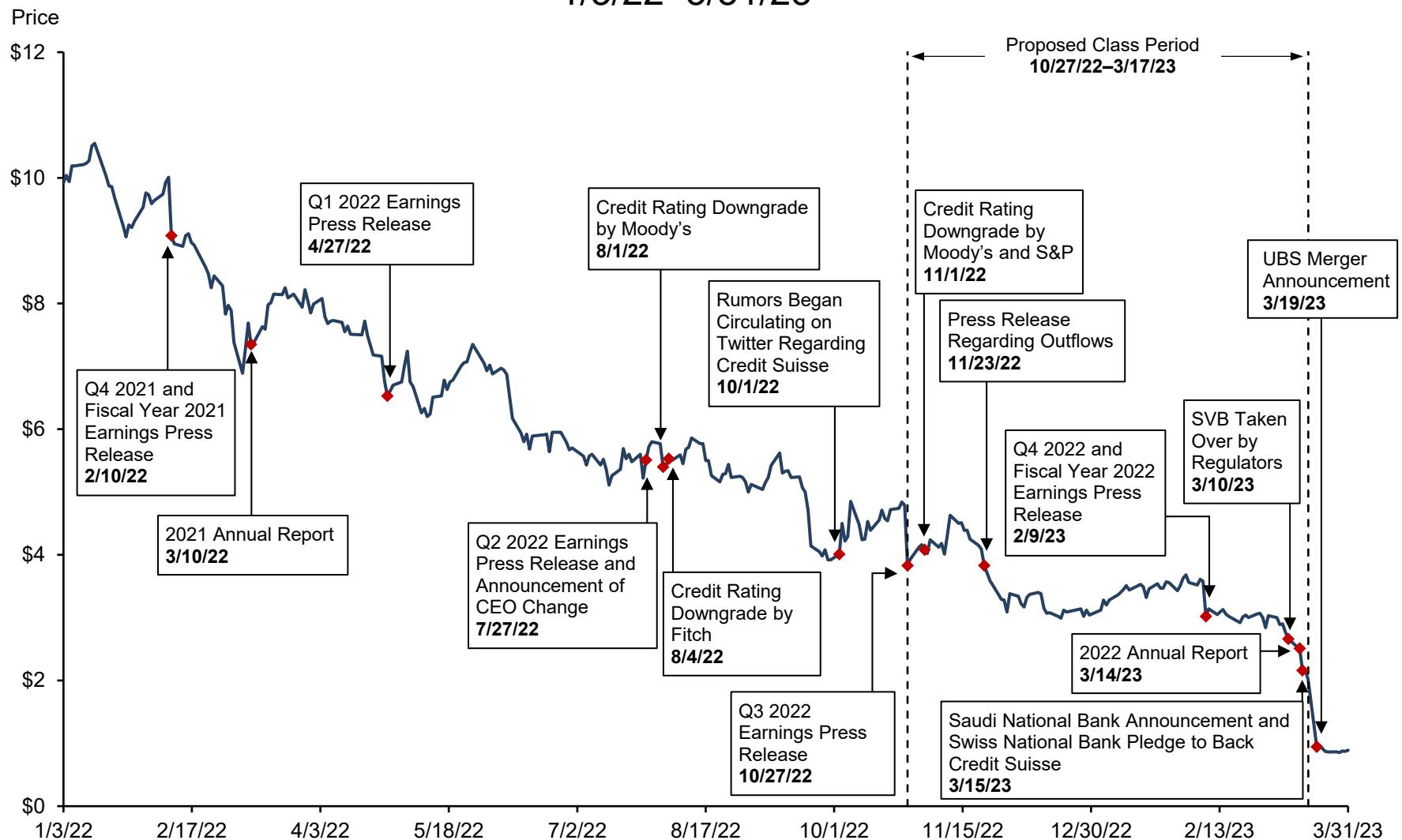
Note:

[1] Represents the rating as of the first day of the Proposed Class Period. 22550L2M2 was issued during the Proposed Class Period on 1/9/23 and received a rating of A- from S&P Global and A3 from Moody's at issuance. The first rating listed is the S&P Global rating, and the second rating listed is the Moody's rating.

[2] Represents the rating as of 3/20/23, the first trading day after the Proposed Class Period.

Credit Suisse Closing ADS Price

1/3/22–3/31/23



Source: CRSP; Factiva; Complaint

Note: For additional discussion of events, see Section V.A. Each date listed in chart corresponds to the date of each event. Each marker is shown on the first trading day on or after the date of each event.

Credit Suisse Asset and Deposit Flows

Q1 2022–Q1 2023

(Figures in CHF billions)

	As of the End of Each Quarter				
	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023 ^[1]
Assets Under Management ("AUM") ^[2]	1,554.9	1,453.9	1,400.6	1,293.6	1,252.6
Net New Assets (Net Asset Outflows) ^[3]	7.9	(7.7)	(12.9)	(110.5)	(61.2)
<i>Total as % of Prior Quarter AUM</i>	<i>0.5%</i>	<i>(0.5%)</i>	<i>(0.9%)</i>	<i>(7.9%)</i>	<i>(4.7%)</i>
Customer Deposits ^[4]	398.6	389.5	371.3	233.2	166.0
<i>% Change from Prior Quarter</i>	<i>1.5%</i>	<i>(2.3%)</i>	<i>(4.7%)</i>	<i>(37.2%)</i>	<i>(28.8%)</i>

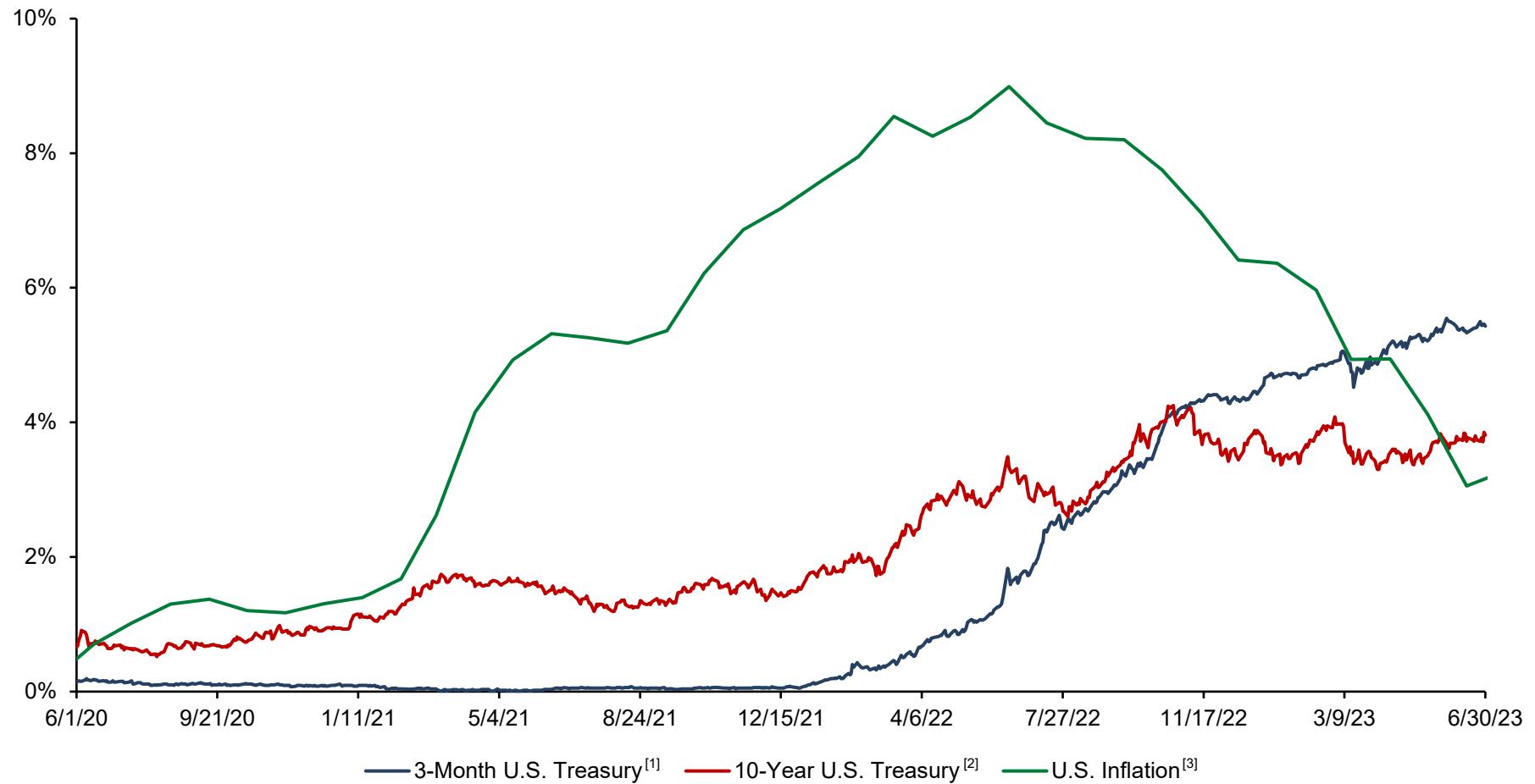
Source: 2022 Annual Report; Credit Suisse SEC Forms 6-K

Note:

- [1] Data for Q1 2023 from Credit Suisse Q1 2023 Earnings Release dated 4/24/23.
- [2] Assets Under Management “include assets for which [Credit Suisse] provides investment advisory or discretionary asset management services, investment fund assets[,] and assets invested in other investment fund-like pooled investment vehicles managed by [Credit Suisse]” (2022 Annual Report, p. 388).
- [3] Net New Assets “measure the degree of success in acquiring assets under management or changes in assets under management through warranted reclassifications.” Net New Assets are calculated “based on the direct method, taking into account individual cash payments, security deliveries and cash flows resulting from loan increases or repayments” (2022 Annual Report, p. 388).
- [4] Customer Deposits include “[n]on-interest-bearing demand deposits,” “[i]nterest-bearing demand deposits,” “[s]avings deposits,” and “[t]ime deposits” (2022 Annual Report, p. 460).

Yields on U.S. Treasuries and U.S. Inflation Rate

6/1/20–6/30/23



Source: *Federal Reserve Economic Data*

Note:

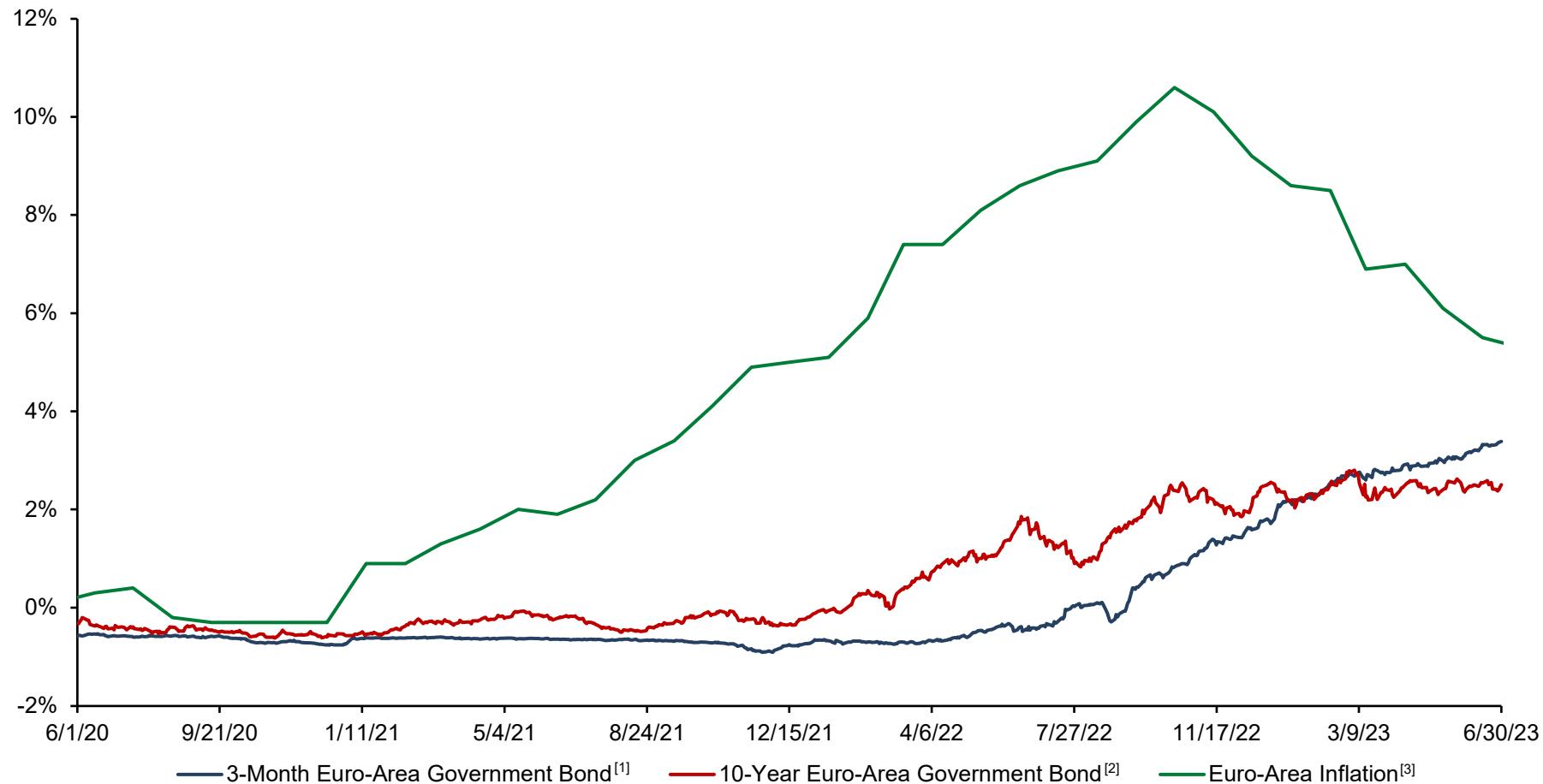
[1] Daily yield on U.S. Treasury Securities at a 3-month constant maturity.

[2] Daily yield on U.S. Treasury Securities at a 10-year constant maturity.

[3] Monthly U.S. inflation is calculated as the percentage difference between the current-month Consumer Price Index ("CPI") and the CPI from 12 months prior. CPI is for all urban consumers, includes all items in the U.S. city averaged, and is seasonally adjusted.

Yields on AAA Euro-Denominated Government Debt and Euro-Area Inflation

6/1/20–6/30/23



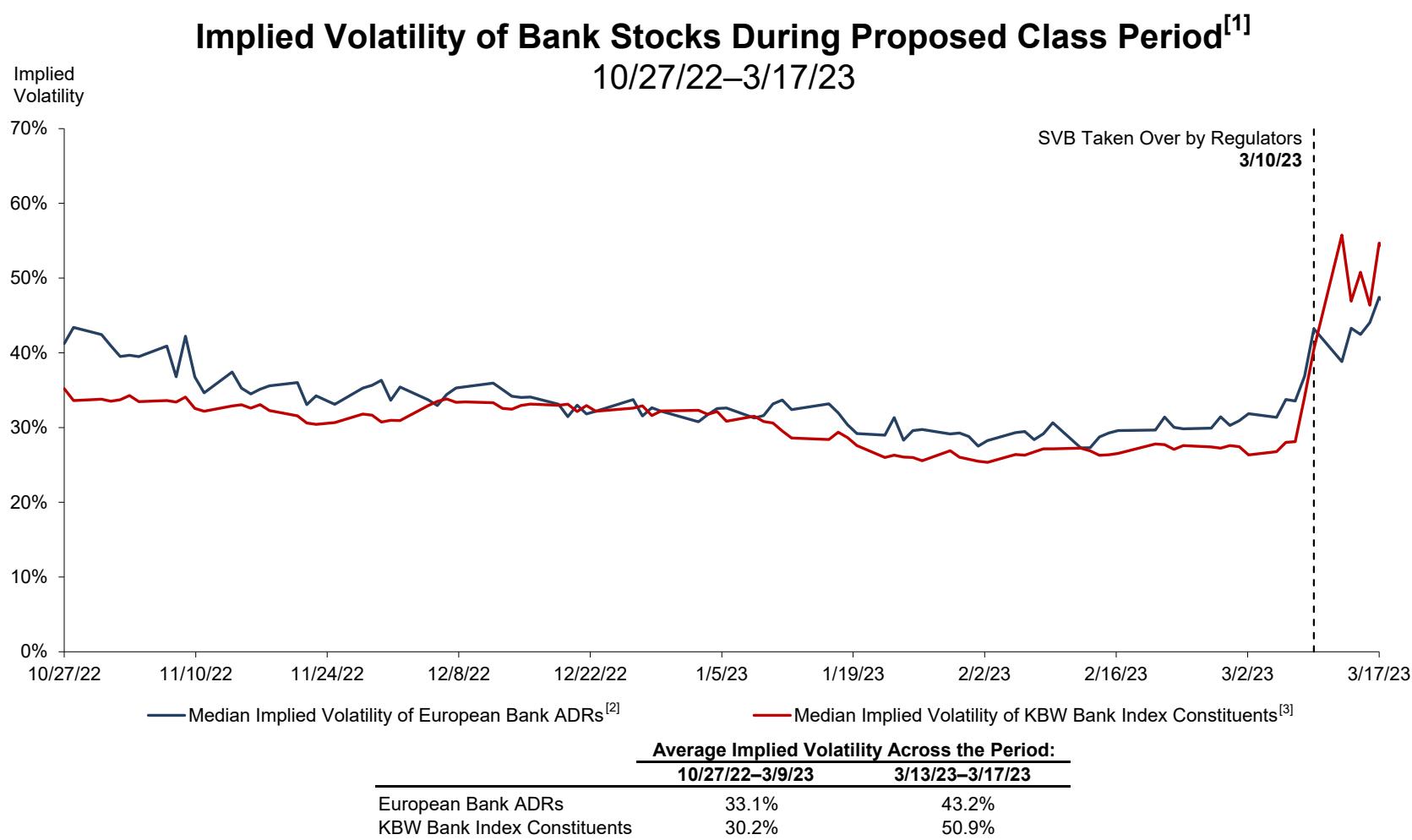
Source: European Central Bank

Note:

[1] Daily yield on Euro-area government bonds from AAA rated issuers at a 3-month maturity.

[2] Daily yield on Euro-area government bonds from AAA rated issuers at a 10-year maturity.

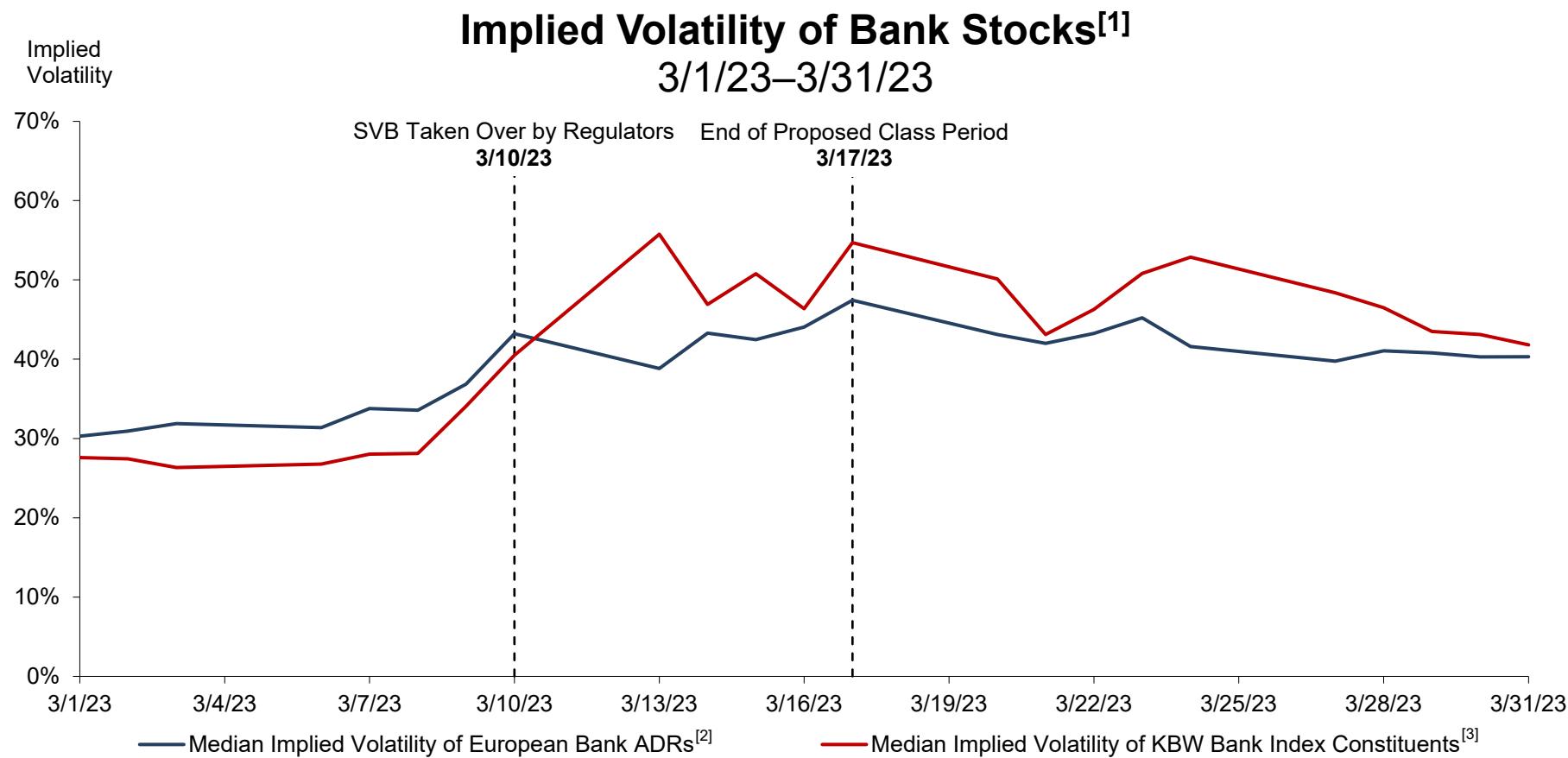
[3] Monthly Euro-area inflation is calculated as the percentage difference between the current-month Harmonized Index of Consumer Prices ("HICP") and the HICP from 12 months prior. HICP is an overall index of Euro-area inflation.



Source: Bloomberg; 2022 Annual Report; SVB Financial Group, Form 8-K, 3/10/23; "KBW Nasdaq Bank Index," Nasdaq, available at <https://indexes.nasdaqomx.com/Index/Weighting/BKX>; "Real-Time Volatilities," Bloomberg, available at https://data.bloomberglp.com/professional/sites/10/750114_Real-Time-Volatilities.pdf

Note:

- [1] Represents median across banks of the "3 month 100% Moneyness Implied Volatility" series from Bloomberg. This series is calculated based on Bloomberg's Listed Implied Volatility Engine ("LIVE"), which interpolates implied volatility for an at-the-money option with three months until expiration across both call and put options.
- [2] Consists of eight European banks with U.S. ADRs listed on a major exchange (Banco Santander, Barclays, BBVA, Deutsche Bank, HSBC, ING Groep, NatWest, UBS). These banks were identified as a "peer group" for return comparison purposes in Credit Suisse's 2022 Annual Report "based on similarities in geographical coverage and scope of business" (p. 250).
- [3] Consists of 22 constituents of the KBW Bank Index as of 12/30/22, excluding Silicon Valley Bank and Signature Bank. Includes Bank of America, BNY Mellon, Capital One, Citigroup, Citizens Financial, Comerica, East West Bank, Fifth Third Bancorp, First Republic, Huntington Bancshares, J.P. Morgan Chase, KeyCorp, M&T Bank, Northern Trust, PNC Financial Services Group, Regions Financial, State Street, Truist, U.S. Bancorp, Wells Fargo, Western Alliance, and Zions Bancorporation.



Source: *Bloomberg*; 2022 Annual Report; SVB Financial Group, Form 8-K, 3/10/23; “KBW Nasdaq Bank Index,” *Nasdaq*, available at <https://indexes.nasdaqomx.com/Index/Weighting/BKX>; “Real-Time Volatilities,” *Bloomberg*, available at https://data.bloomberg.com/professional/sites/10/750114_Real-Time-Volatilities.pdf

Note:

- [1] Represents median across banks of the “3 month 100% Moneyness Implied Volatility” series from *Bloomberg*. This series is calculated based on *Bloomberg*’s Listed Implied Volatility Engine (“LIVE”), which interpolates implied volatility for an at-the-money option with three months until expiration across both call and put options.
- [2] Consists of eight European banks with U.S. ADRs listed on a major exchange (Banco Santander, Barclays, BBVA, Deutsche Bank, HSBC, ING Groep, NatWest, UBS). These banks were identified as a “peer group” for return comparison purposes in Credit Suisse’s 2022 Annual Report “based on similarities in geographical coverage and scope of business” (p. 250).
- [3] Consists of 22 constituents of the KBW Bank Index as of 12/30/22, excluding Silicon Valley Bank and Signature Bank. Includes Bank of America, BNY Mellon, Capital One, Citigroup, Citizens Financial, Comerica, East West Bank, Fifth Third Bancorp, First Republic, Huntington Bancshares, J.P. Morgan Chase, KeyCorp, M&T Bank, Northern Trust, PNC Financial Services Group, Regions Financial, State Street, Truist, U.S. Bancorp, Wells Fargo, Western Alliance, and Zions Bancorporation.

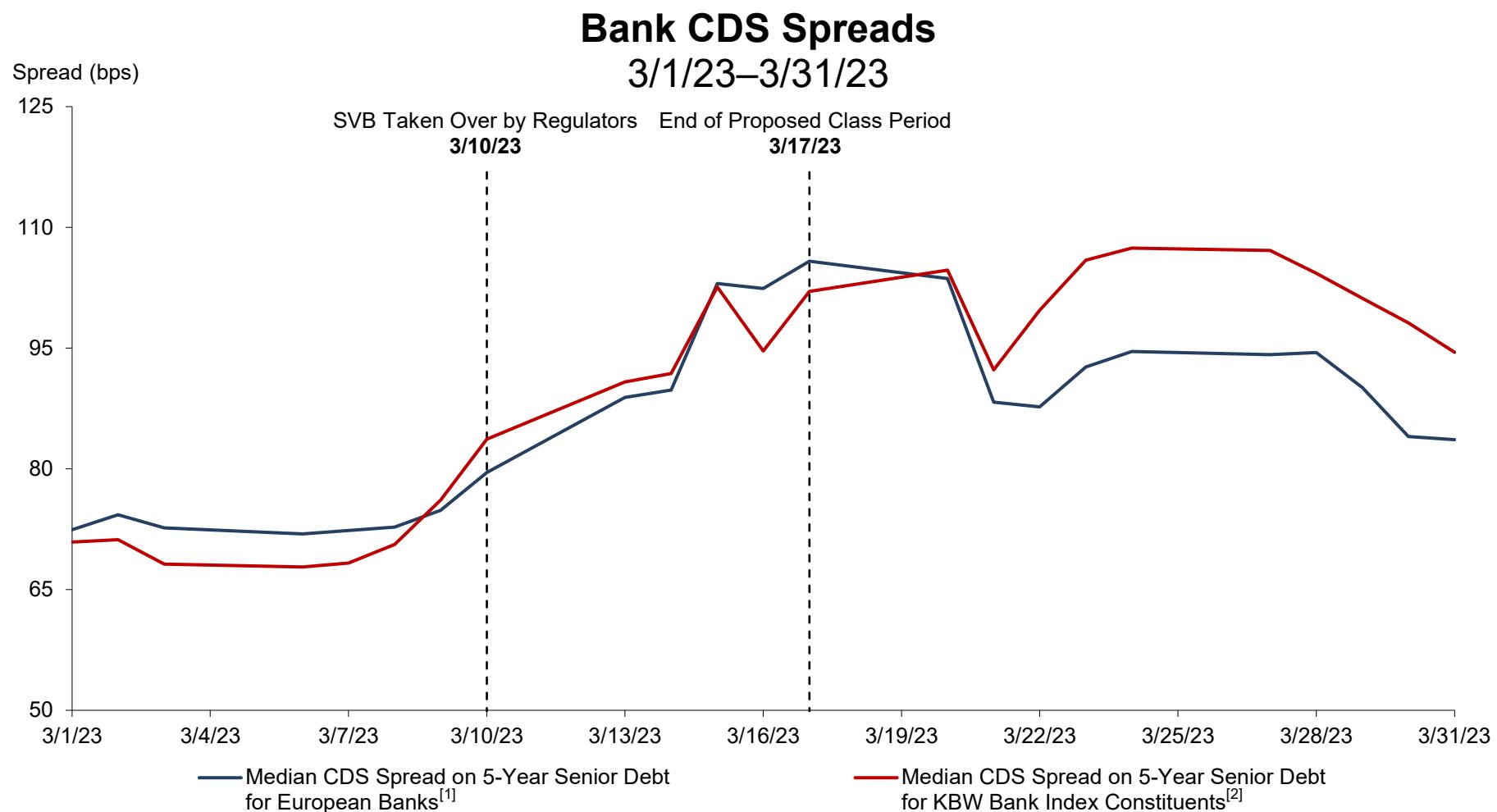
Average Standard Deviation of Daily Returns of Banks During Proposed Class Period^[1]

	10/27/22–3/9/23	3/13/23–3/17/23
European Bank ADRs ^[2]	1.81%	4.37%
KBW Bank Index Constituents ^[3]	2.01%	8.70%

Source: CRSP; 2022 Annual Report; “KBW Nasdaq Bank Index,” Nasdaq, available at <https://indexes.nasdaqomx.com/Index/Weighting/BKX>

Note:

- [1] Average standard deviation of daily returns is calculated as the simple average across banks of the standard deviation of each bank's returns across the listed date range.
- [2] Consists of eight European banks with U.S. ADRs listed on a major exchange (Banco Santander, Barclays, BBVA, Deutsche Bank, HSBC, ING Groep, NatWest, and UBS). These banks were identified as a “peer group” for return comparison purposes in Credit Suisse’s 2022 Annual Report “based on similarities in geographical coverage and scope of business” (p. 250).
- [3] Consists of 22 constituents of the KBW Bank Index as of 12/30/22, excluding Silicon Valley Bank and Signature Bank. Includes Bank of America, BNY Mellon, Capital One, Citigroup, Citizens Financial, Comerica, East West Bank, Fifth Third Bancorp, First Republic, Huntington Bancshares, J.P. Morgan Chase, KeyCorp, M&T Bank, Northern Trust, PNC Financial Services Group, Regions Financial, State Street, Truist, U.S. Bancorp, Wells Fargo, Western Alliance, and Zions Bancorporation.



Source: *Capital IQ*; 2022 Annual Report; SVB Financial Group, Form 8-K, 3/10/23

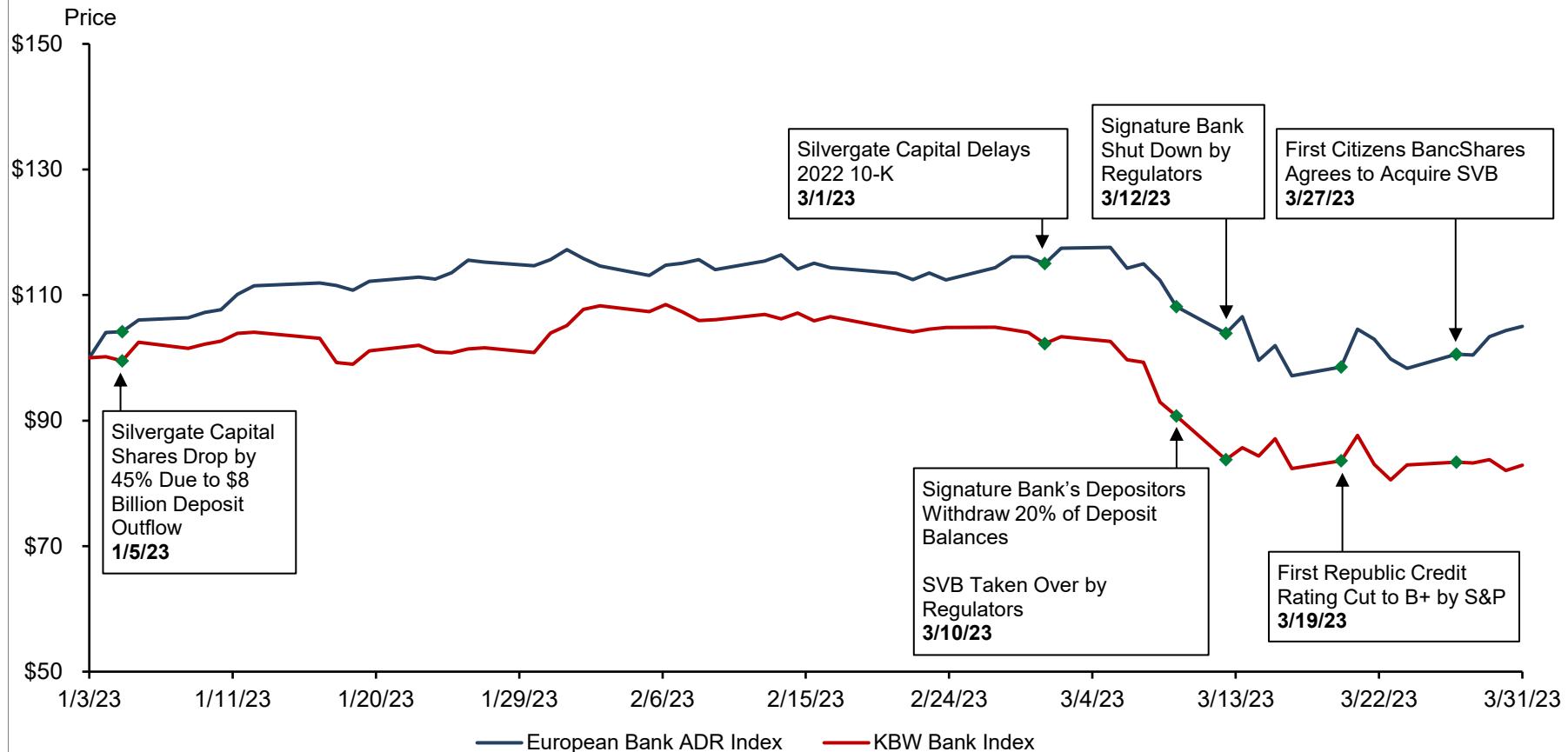
Note:

[1] Consists of eight European banks with U.S. ADRs listed on a major exchange (Banco Santander, Barclays, BBVA, Deutsche Bank, HSBC, ING Groep, NatWest, UBS). These banks were identified as a “peer group” for return comparison purposes in Credit Suisse’s 2022 Annual Report “based on similarities in geographical coverage and scope of business” (p. 250).

[2] Consists of 13 constituents of the KBW Bank Index as of 12/30/22 with available data from *Capital IQ*, excluding Silicon Valley Bank and Signature Bank. Includes Bank of America, BNY Mellon, Capital One, Citigroup, Fifth Third Bancorp, J.P. Morgan Chase, KeyCorp, Northern Trust, PNC Financial Services Group, State Street, Truist, U.S. Bancorp, and Wells Fargo. Data were not available for nine constituents (Citizens Financial, Comerica, East West Bank, First Republic, Huntington Bancshares, M&T Bank, Regions Financial, Western Alliance, and Zions Bancorporation).

KBW Bank Index and European Bank ADR Index: 2023 Banking Crisis

1/3/23–3/31/23

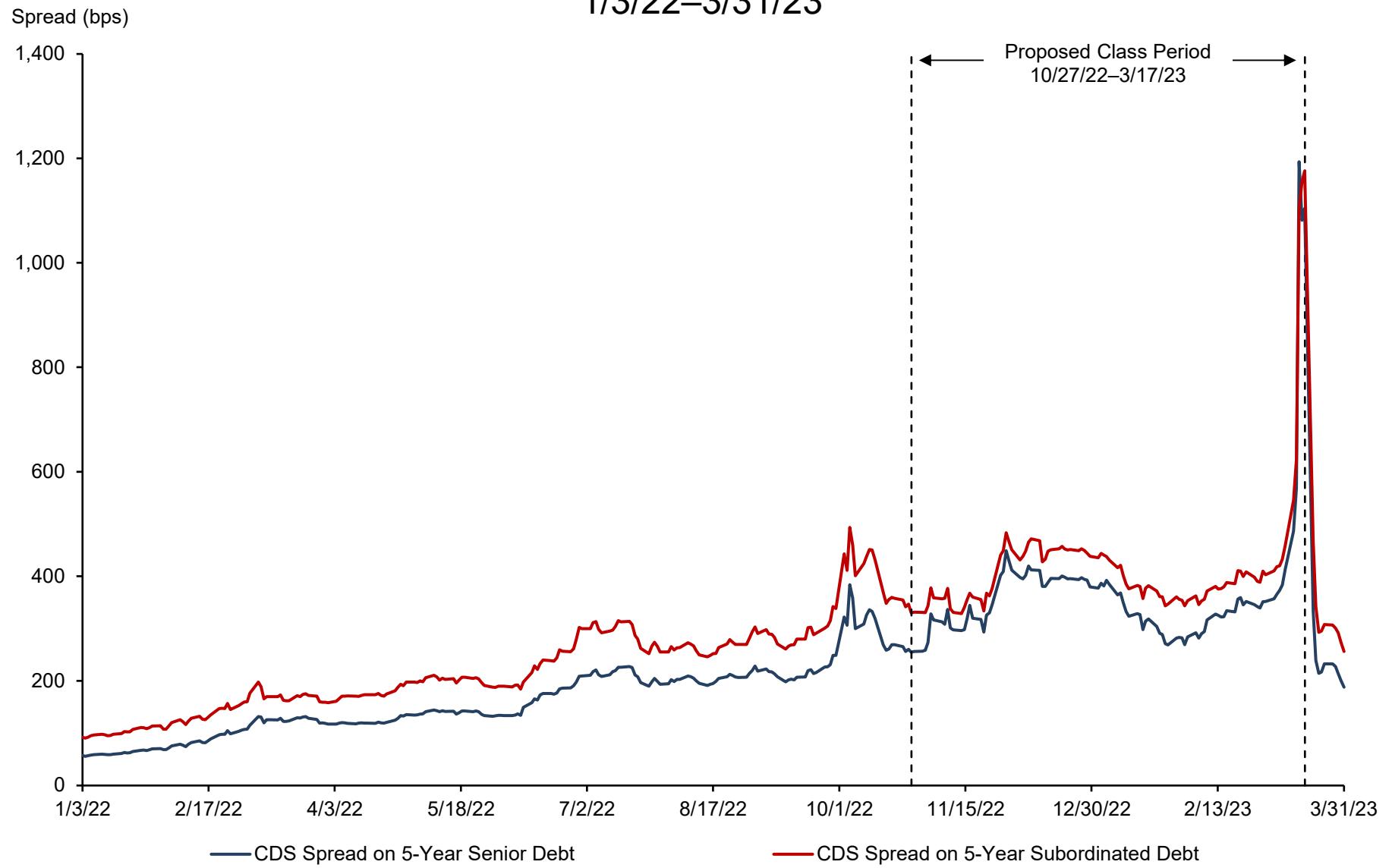


Source: Bloomberg; CRSP; Factiva; 2022 Annual Report

Note: Returns for the KBW Bank Index and the European Bank ADR Index are pegged to \$100 on 1/3/23. The European Bank ADR Index represents an equal-weighted index consisting of eight European banks with U.S. ADRs listed on a major exchange (Banco Santander, Barclays, BBVA, Deutsche Bank, HSBC, ING Groep, NatWest, UBS). These banks were identified as a “peer group” for return comparison purposes in Credit Suisse’s 2022 Annual Report “based on similarities in geographical coverage and scope of business” (p. 250).

Credit Suisse CDS Spreads

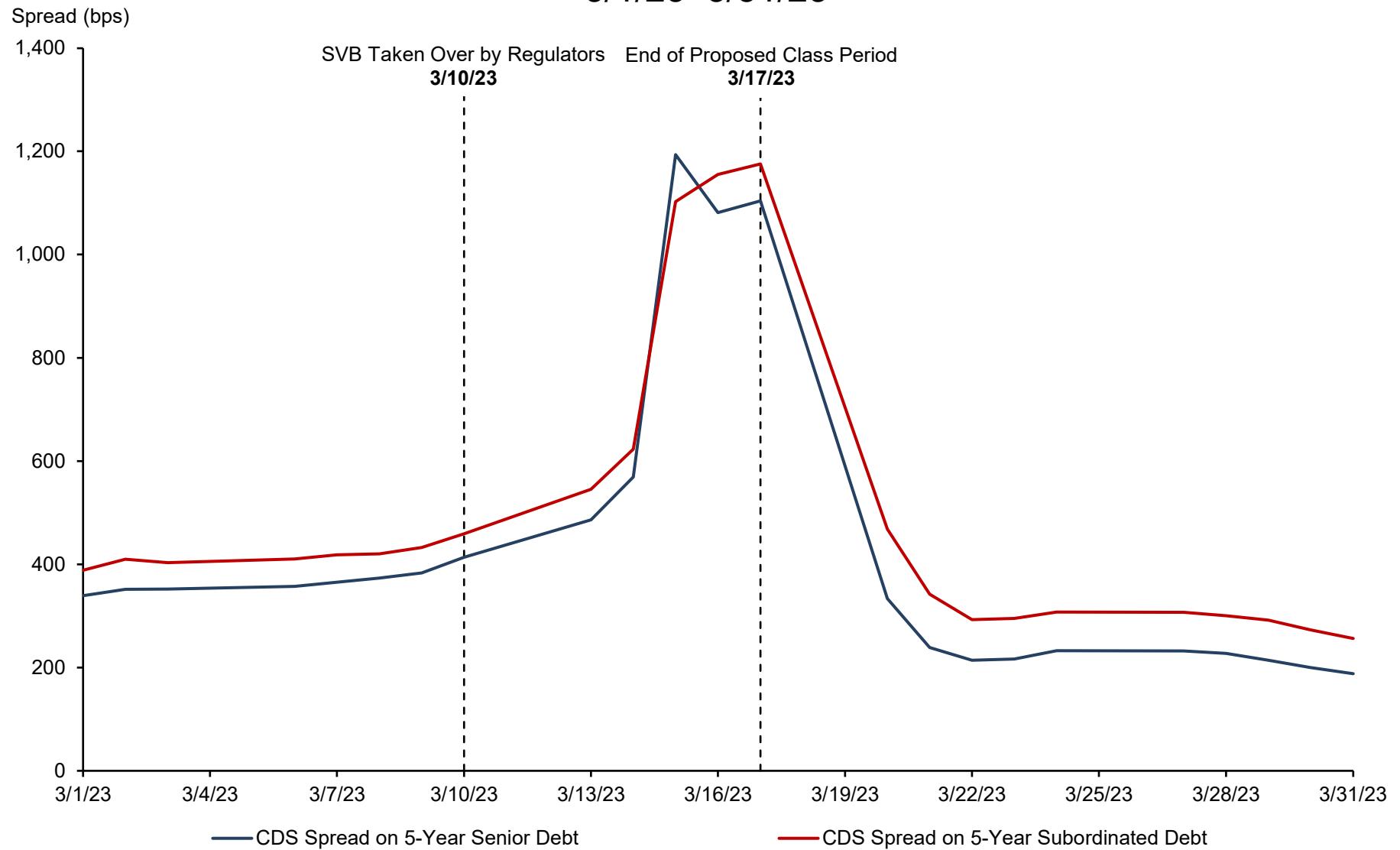
1/3/22–3/31/23



Source: *Capital IQ*

Credit Suisse CDS Spreads

3/1/23–3/31/23



Source: *Capital IQ*; SVB Financial Group, Form 8-K, 3/10/23

Credit Suisse

Select Risk Disclosures on Liquidity, Asset Flows, and Deposit Flows

Statement	Source
Our liquidity could be impaired if we were unable to access the capital markets, sell our assets or if our liquidity costs increase[.] Our ability to borrow on a secured or unsecured basis and the cost of doing so can be affected by increases in interest rates or credit spreads, the availability of credit, regulatory requirements relating to liquidity, including the possible amendments to the Swiss liquidity ordinance to increase the regulatory minimum liquidity requirements for systemically important banks, or the market perceptions of risk relating to us, certain of our counterparties or the banking sector as a whole, including our perceived or actual creditworthiness.	2021 Annual Report, p. 38
If we are unable to raise needed funds in the capital markets (including through offerings of equity, regulatory capital securities and other debt), we may need to liquidate unencumbered assets to meet our liabilities. In a time of reduced liquidity, we may be unable to sell some of our assets, or we may need to sell assets at depressed prices, which in either case could adversely affect our results of operations and financial condition.	2021 Annual Report, p. 38
Our businesses rely significantly on our deposit base for funding[.] Our businesses benefit from short-term funding sources, including primarily demand deposits, inter-bank loans, time deposits and cash bonds. Although deposits have been, over time, a stable source of funding, this may not continue. In that case, our liquidity position could be adversely affected, and we might be unable to meet deposit withdrawals on demand or at their contractual maturity, to repay borrowings as they mature or to fund new loans, investments and businesses.	2021 Annual Report, p. 38
Changes in our ratings may adversely affect our business[.] Ratings are assigned by rating agencies. Rating agencies may lower, indicate their intention to lower or withdraw their ratings at any time. ... In July 2021, Moody's Investors Service lowered its long-term senior unsecured debt and deposit ratings of Credit Suisse AG by one notch. Any downgrades in our ratings could increase our borrowing costs, limit our access to capital markets, increase our cost of capital and adversely affect the ability of our businesses to sell or market their products, engage in business transactions, particularly financing and derivatives transactions, and retain our clients.	2021 Annual Report, p. 38

Credit Suisse

Select Risk Disclosures on Liquidity, Asset Flows, and Deposit Flows

Statement	Source
Cautious investor behavior in response to adverse conditions could result in generally decreased client demand for our products, which could negatively impact our results of operations and opportunities for growth. Unfavorable market and economic conditions have affected our businesses in the past, including the low interest rate environment, continued cautious investor behavior and changes in market structure. These negative factors could be reflected, for example, in lower commissions and fees from our client-flow sales and trading and asset management activities, including commissions and fees that are based on the value of our clients' portfolios.	2021 Annual Report, p. 41
Defaults by one or more large financial institutions could adversely affect financial markets generally and us specifically[.] Concerns, rumors about or an actual default by one institution could lead to significant liquidity problems, losses or defaults by other institutions because the commercial soundness of many financial institutions may be closely related as a result of credit, trading, clearing or other relationships between institutions.	2021 Annual Report, p. 44
Significant negative consequences of the supply chain finance funds and Archegos matters[.] There can be no assurance that any additional losses, damages, costs and expenses, as well as any further regulatory and other investigations and actions or any further downgrade of our credit ratings, will not be material to us, including from any impact on our business, financial condition, results of operations, prospects, liquidity or capital position.	2021 Annual Report, p. 66
Liquidity issues in October 2022 and credit ratings downgrades[.] During the first two weeks of October 2022, following negative press and social media coverage based on incorrect rumors, Credit Suisse experienced significantly higher withdrawals of cash deposits as well as non-renewal of maturing time deposits. These outflows have since stabilized to much lower levels but have not yet reversed. ... On November 1, 2022, Moody's Investors Service affirmed the senior unsecured debt ratings of Credit Suisse Group AG and downgraded the long-term senior unsecured debt and deposit ratings of Credit Suisse AG by one notch. ... These circumstances have exacerbated the risks we described under "Liquidity Risk" in our Risk Factors contained in our 2021 Annual Report.	Q3 2022 Financial Report, p. 9

Credit Suisse

Select Risk Disclosures on Liquidity, Asset Flows, and Deposit Flows

Statement	Source
During the month of October 2022, following negative press and social media coverage based on incorrect rumors, Credit Suisse experienced client asset outflows at levels that substantially exceeded the rates incurred in 3Q22. ... It is premature to estimate the impact on net new asset flows for 4Q22 but, coupled with reductions in asset values due to adverse market movements in client portfolios in 3Q22, this reduction in assets under management may lead to decreased fee revenues for the Group, thereby leading to reduced profitability.	Q3 2022 Financial Report, p. 9
A downgrade in credit ratings could reduce the Group's access to capital markets, increase its borrowing costs, require the Group to post additional collateral or allow counterparties to terminate transactions under certain of its trading and collateralized financing and derivative contracts. This, in turn, could reduce the Group's liquidity and negatively impact its operating results and financial position.	Q3 2022 Financial Report, p. 81
Significant negative consequences of liquidity issues and outflows in assets under management in the fourth quarter of 2022[.] As previously disclosed, early in the fourth quarter of 2022, Credit Suisse began experiencing significantly higher withdrawals of cash deposits, non-renewal of maturing time deposits and net asset outflows at levels that substantially exceeded the rates incurred in the third quarter of 2022. These outflows stabilized to much lower levels but had not yet reversed as of the date of this report. These outflows led us to partially utilize liquidity buffers at the Group and legal entity level, and we fell below certain legal entity-level regulatory requirements. These circumstances have exacerbated and may continue to exacerbate the risks described above in this section. In addition, this reduction in assets under management is expected to lead to reduced net interest income and recurring commissions and fees for the Group, which in turn could affect our ability to achieve our capital position objectives. A failure to reverse these outflows and to restore our assets under management and deposits could have a material adverse effect on our results of operations and financial condition.	2022 Annual Report, p. 40
These downgrades in our ratings increasingly elevated our borrowing costs and limited our ability to renew maturing short-term funding and to access short-term funding markets. The downgrades have increased our cost of capital and adversely affected and may in the future continue to adversely affect the ability of our businesses to sell or market their products, engage in business transactions, particularly financing and derivative transactions, and retain our clients.	2022 Annual Report, p. 41

Credit Suisse

Select Risk Disclosures on Liquidity, Asset Flows, and Deposit Flows

Statement	Source
If our trading or other agreements are terminated in relation to a credit rating downgrade, we may sustain losses or reductions to our liquidity that require us to seek other financing sources or make significant payments, whether in cash or securities.	2022 Annual Report, p. 41
While we are taking steps to address these material weaknesses, which could require us to expend significant resources to correct the material weaknesses or deficiencies, any gaps or deficiencies in our internal control over financing reporting may result in us being unable to provide required financial information in a timely and reliable manner and/or incorrectly reporting financial information, which could reduce confidence in our published information, impact access to capital markets, impact the trading price of our securities or subject us to potential regulatory investigations and sanctions.	2022 Annual Report, p. 51

Source: 2021 Annual Report; 2022 Annual Report; Q3 2022 Financial Report

Note: Risk disclosures repeated in multiple quarterly or annual reports are only included once in the table.

List of Alleged Misrepresentations and Omissions Based on Complaint

No.	Event Date ^[1]	Event	Deemed Actionable in MTD Order
1	4/6/21	Media Releases and Compensation Report Update	
2	4/6/21	Defendant Gottstein Interview with <i>Neue Zürcher Zeitung</i>	
3	4/22/21	First Quarter 2021 Media Release and Investor Presentation	
4	4/22/21	First Quarter 2021 Earnings Press Release	
5	4/22/21	Defendant Gottstein's Statements to Reporters	
6	4/22/21	First Quarter 2021 Earnings Conference	
7	4/22/21	First Quarter 2021 Press Conference	
8	4/30/21	Annual General Meeting of Shareholders	
9	5/6/21	First Quarter 2021 Report	
10	6/30/21	Defendant Horta-Osório Interview with <i>Neue Zürcher Zeitung</i> ^[2]	
11	7/27/21	David Wildermuth Appointment Media Release	
12	7/29/21	Archegos Media Press Release and Report	
13	7/29/21	Second Quarter 2021 Earnings Press Release	
14	7/29/21	Second Quarter 2021 Report	
15	7/29/21	Second Quarter 2021 Earnings Conference	
16	7/29/21	Second Quarter 2021 Press Conference	
17	8/13/21	Axel Lehman and Juan Colombas Nominations Media Release	
18	9/26/21	Defendant Horta-Osório and Gottstein Interview with <i>SonntagsBlick</i>	
19	11/4/21	Investor Day 2021 Media Release and Investor Presentation	
20	11/4/21	Investor Day	
21	11/4/21	Third Quarter 2021 Media Release and Investor Presentation	
22	11/4/21	Third Quarter 2021 Report	
23	11/4/21	Defendants Horta-Osório and Gottstein Interview with <i>Bloomberg TV</i>	
24	11/4/21	Third Quarter 2021 Earnings Conference ^[3]	
25	11/7/21	Defendants Horta-Osório and Gottstein Interview with <i>Neue Zürcher Zeitung</i>	
26	1/16/22	Defendant Horta-Osório "Resignation" and Defendant Lehmann Appointment Media Release ^[4]	
27	1/25/22	Preliminary Fourth Quarter and Fiscal Year 2021 Earnings Media Release	
28	2/10/22	Fourth Quarter and Fiscal Year 2021 Media Release and Investor Presentation	
29	2/10/22	Fourth Quarter and Fiscal Year 2021 Earnings Press Release	
30	2/10/22	Fourth Quarter and Fiscal Year 2021 Earnings Conference	
31	2/18/22	Defendant Gottstein Interview with <i>Finanz und Wirtschaft</i>	
32	2/20/22	Suisse Secrets Press Release	
33	3/10/22	2021 Annual Report	
34	3/15/22	Morgan Stanley European Financials Conference	
35	4/4/22	Credit Suisse Answers to Ethos Foundation Information Request Regarding Greensill Funds and Suisse Secrets	

List of Alleged Misrepresentations and Omissions Based on Complaint

No.	Event Date ^[1]	Event	Deemed Actionable in MTD Order
36	4/20/22	Preliminary First Quarter 2022 Earnings Media Release	
37	4/27/22	First Quarter 2022 Media Release and Investor Presentation	
38	4/27/22	First Quarter 2022 Earnings Press Release	
39	4/27/22	First Quarter 2022 Earnings Conference	
40	4/27/22	First Quarter 2022 Press Conference	
41	4/29/22	Annual General Meeting of Shareholders	
42	5/5/22	First Quarter 2022 Report	
43	5/23/22	Defendant Lehmann Interview with <i>CNBC</i>	
44	5/30/22	Denial of <i>Reuters</i> Report On Capital Raise ^[5]	
45	6/8/22	Preliminary Second Quarter 2022 Earnings Media Release	
46	6/28/22	Investor Deep Dive 2022 Presentation	
47	7/27/22	Defendant Gottstein “Resignation” and Defendant Körner Appointment Media Release	
48	7/27/22	Second Quarter 2022 Media Release and Investor Presentation	
49	7/27/22	Second Quarter 2022 Earnings Press Release	
50	7/27/22	Second Quarter 2022 Earnings Conference	
51	7/27/22	Defendant Lehmann Interview with <i>Bloomberg TV</i>	
52	7/29/22	Second Quarter 2022 Report	
53	8/22/22	Defendant Mathers “Resignation” and Defendant Joshi Appointment Media Release	
54	10/14/22	Defendant Lehmann Speech at the Institute of International Finance	
55	10/27/22	2022 Strategic Review Media Release	
56	10/27/22	2022 Strategy Update Presentation	✓
57	10/27/22	Rights Offering Media Release	
58	10/27/22	Third Quarter 2022 Media Release and Investor Presentation	✓
59	10/27/22	Third Quarter 2022 Earnings Press Release	✓
60	10/27/22	Third Quarter 2022 Earnings Conference	✓
61	10/27/22	Defendant Körner Interview with <i>CNBC</i>	
62	10/31/22	Defendant Körner Interview with <i>Bloomberg TV</i>	✓
63	11/2/22	Third Quarter 2022 Report	✓
64	11/15/22	SPG/Apollo Media Release	
65	11/23/22	Preliminary Fourth Quarter 2022 Earnings Media Release	✓
66	11/23/22	Rights Offering Media Release	
67	12/1/22	Defendant Lehmann <i>Financial Times</i> Interview	✓
68	12/2/22	Defendant Lehmann <i>Bloomberg</i> Interviews	✓
69	12/5/22	Defendant Lehmann Interview with <i>SRF</i>	✓
70	12/8/22	Rights Offering Media Release	

List of Alleged Misrepresentations and Omissions Based on Complaint

No.	Event Date ^[1]	Event	Deemed Actionable in MTD Order
71	1/17/23	Defendant Lehmann Interview with <i>Bloomberg TV</i>	
72	2/9/23	Fourth Quarter and Fiscal Year 2022 Media Release and Investor Presentation	
73	2/9/23	Fourth Quarter and Fiscal Year 2022 Earnings Press Release	✓
74	2/9/23	Fourth Quarter and Fiscal Year 2022 Earnings Conference	✓
75	2/9/23	Fourth Quarter and Fiscal Year 2022 Press Conference	
76	2/9/23	Defendant Körner Interview with <i>Bloomberg TV</i>	✓
77	3/14/23	2022 Annual Report	✓
78	3/14/23	2022 Annual Report SOX Certifications	✓
79	3/14/23	Defendant Körner Speech at European Financials Conference	✓
80	3/14/23	Defendant Körner Interview with <i>Bloomberg</i>	✓
81	3/15/23	Defendant Lehmann Speech at Financial Sector Conference ^[6]	✓
82	3/15/23	Defendant Körner Interview with CNA	✓

Source: *Factiva*; Complaint; MTD Order; "Financial Sector Conference 2023," *Saudi vision 2030*, available at <https://vision2030.gov.sa/en/media/media/financial-sector-conference-2023>; "Edited Transcript Q3 2021 Credit Suisse Group AG Earnings Call," *Refinitiv Streetevents*, 11/4/21.

Note:

- [1] The date of each event is based on the Eastern Time Zone (ET).
- [2] Complaint states event occurred on 7/1/21, but article was published on 6/30/21, according to *Factiva*. See "Credit Suisse to Realign Strategy This Year, Chairman Says," *Reuters*, 6/30/21.
- [3] Complaint states event occurred on 11/6/21, but the earnings conference was held on 11/4/21. See "Edited Transcript Q3 2021 Credit Suisse Group AG Earnings Call," *Refinitiv Streetevents*, 11/4/21.
- [4] Complaint states event occurred on 1/17/22, but public press indicates that the information was public on 1/16/22, according to *Factiva*. See "Credit Suisse Group Appoints Axel P. Lehmann as New Chairman; António Horta-Osório Has Resigned," *Reuters*, 1/16/22.
- [5] Complaint states event occurred on 5/31/22, but article was published on 5/30/22, according to *Factiva*. See "Exclusive-Credit Suisse Weighs Options to Strengthen Capital - Sources," *Reuters*, 5/30/22.
- [6] Complaint states event occurred on 3/13/23, but Financial Sector Conference was held on 3/15/23 and 3/16/23. See "Financial Sector Conference 2023," *Saudi vision 2030*, available at <https://vision2030.gov.sa/en/media/media/financial-sector-conference-2023>.

Credit Suisse
Cain Report ADS Event Study Using Alternative Exclusion Dates^[1]
Event Study Model for 3/14/23

Exclusion Dates:	Cain Exclusion Dates ^[2]	Cain Exclusion Dates without Outlier Dates ^[3]	Dates Deemed Actionable in MTD Order ^[4]	Dates Listed in Complaint ^[5]
Market Index	0.33	0.00	-0.02	-0.06
<i>p-value</i>	0.239	0.997	0.956	0.856
Industry Index	1.36	1.48	1.51	1.47
<i>p-value</i>	0.000 *	0.000 *	0.000 *	0.000 *
Constant	0.00	0.00	0.00	0.00
<i>p-value</i>	0.052	0.456	0.311	0.447
Observations	115	117	112	106
Adjusted R ²	56.1%	41.5%	45.0%	45.0%
RMSE	0.024	0.030	0.029	0.027
3/14/23 Residual Return	-5.2%	-5.2%	-5.2%	-5.1%
<i>p-value</i>	0.033 *	0.085	0.072	0.066

Source: Cain Report and Production; 2022 Annual Report; Complaint; MTD Order

Note:

- [1] Credit Suisse ADS returns are regressed on the returns of the S&P 500 Index and the Cain Bank Index. The control period is 120 days prior to the date of interest, excluding the listed exclusion dates. See Cain Report, Section V.E.i. An “*” indicates the p-value is statistically significant at the 95% confidence level.
- [2] Cain Exclusion Dates excludes the following dates from estimation: “the alleged revelatory disclosure dates on February 9, 2023, March 14, 2023, and March 20, 2023; earnings release dates on... October 27, 2022; and February 9, 2023; earnings pre-announcement dates of... November 23, 2022; and outlier dates of October 7, 2022... and December 2, 2022.” See Cain Report, Section V.E.i.
- [3] Cain Exclusion Dates without Outlier Dates excludes the following dates from estimation: 10/27/22, 11/23/22, 2/9/23, 3/14/23, and 3/20/23. See Cain Report, Section V.E.i.
- [4] The Dates Deemed Actionable in the MTD Order set excludes from the estimation eight impact dates associated with alleged misrepresentations and disclosures that I understand were deemed actionable based on the MTD Order: 10/27/22, 11/1/22, 11/2/22, 11/23/22, 12/1/22, 12/2/22, 12/5/22, and 2/9/23.
- [5] The Dates Listed in Complaint set excludes from the estimation 14 impact dates associated with alleged misrepresentations and disclosures in the Complaint: 9/23/22, 10/14/22, 10/27/22, 11/1/22, 11/2/22, 11/15/22, 11/23/22, 11/25/22, 12/1/22, 12/2/22, 12/5/22, 12/8/22, 1/17/23, and 2/9/23.

Percentage of Index Constituents with Statistically Significant Residual Returns^[1]

10/27/22–3/17/23

Period	Cain Peer Index ^[2]	KBW Bank Index ^[3]
10/27/22–3/9/23	4.4%	6.1%
3/13/23	37.5%	77.3%
3/14/23	12.5%	22.7%
3/15/23	42.9%	36.4%
3/16/23	14.3%	9.1%
3/17/23	0.0%	9.1%
3/13/23–3/17/23	21.6%	30.9%

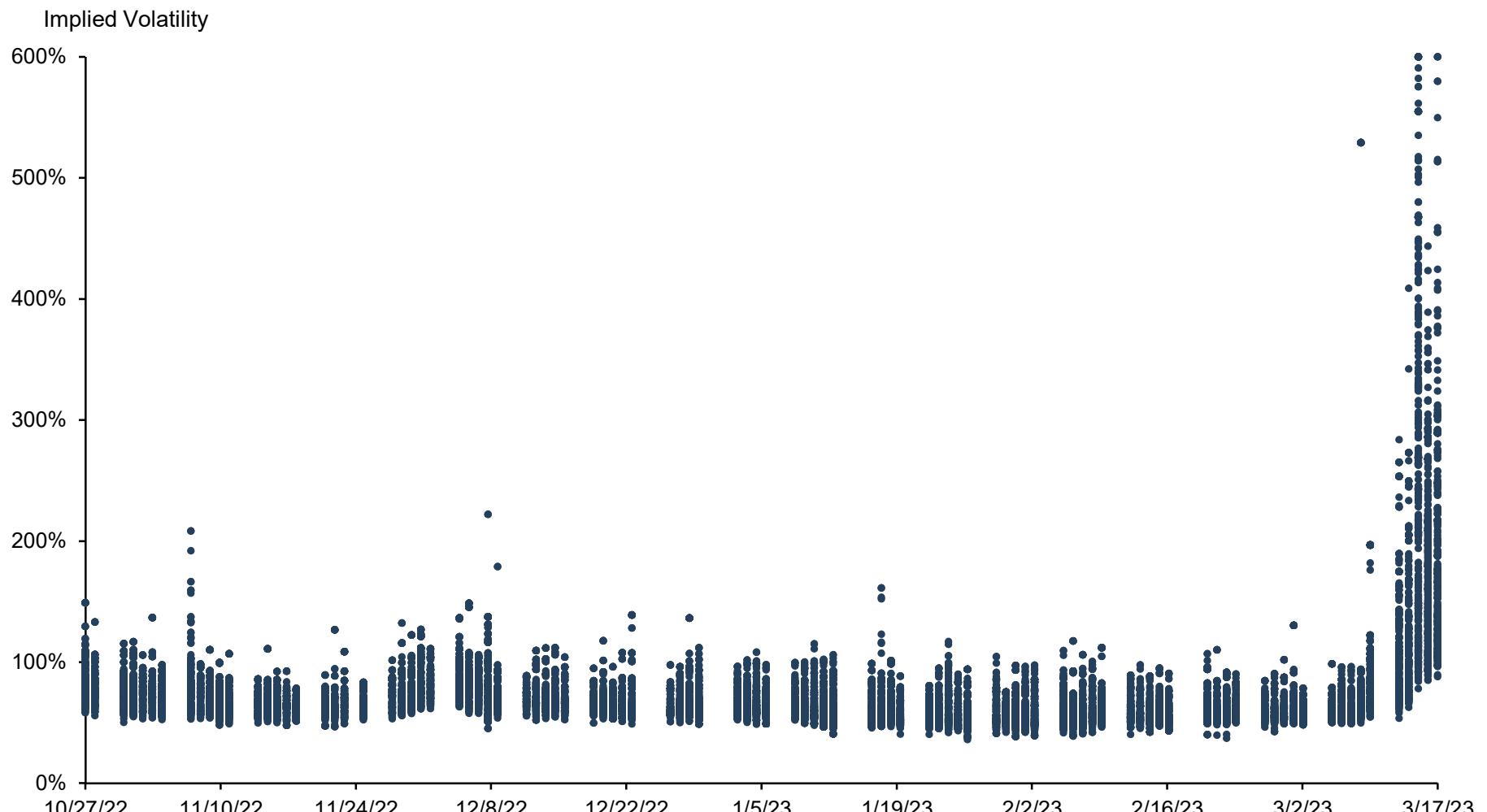
Source: CRSP; Cain Report and Production; Complaint; MTD Order

Note:

- [1] Returns of each constituent of either the Cain Peer Index or KBW Bank Index are regressed on the returns of the S&P 500 Index and the Cain Peer Index. The control period is 120 days prior to the date of interest, excluding the Cain Exclusion Dates. See Cain Report, Section V.E.i. When applying Dr. Cain's methodology to predict returns for a company included in the Cain Peer Index, I exclude this company from the calculation of Cain Peer Index returns.
- [2] The Cain Peer Index is an "equal-weighted index comprised of the peers that Credit Suisse lists in its SEC Form 20-F filings filed on March 10, 2022 and March 14, 2023, p. 265 and 250 in the respective filings." See Cain Report, Section V.E.i.
- [3] Consists of 22 constituents of the KBW Bank Index as of 12/30/22, excluding Silicon Valley Bank and Signature Bank. Includes Bank of America, BNY Mellon, Capital One, Citigroup, Citizens Financial, Comerica, East West Bank, Fifth Third Bancorp, First Republic, Huntington Bancshares, J.P. Morgan Chase, KeyCorp, M&T Bank, Northern Trust, PNC Financial Services Group, Regions Financial, State Street, Truist, U.S. Bancorp, Wells Fargo, Western Alliance, and Zions Bancorporation.

Implied Volatilities of Credit Suisse Options

10/27/22–3/17/23



Source: *iVolatility*

Note: Includes all Credit Suisse Options with at least one day with trading during the Proposed Class Period.

Summary of Credit Suisse Options

10/27/22–3/17/23

All Options ^[1]	# Options	# of Unique Strike Prices	# of Unique Expiration Dates
Calls	685	54	32
Puts	685	54	32
All Options	1,370	54	32
Options with at Least One Day of Trading During Proposed Class Period^[2]			
Calls	453	44	32
Puts	431	42	32
All Options	884	46	32
Options Analyzed in the Cain Report^[3]			
Calls	11	6	9
Puts	11	6	9
All Options	22	8	9

Source: CBOE; Cain Report and Production

Note:

- [1] Includes all Credit Suisse Options with at least one quote during the Proposed Class Period.
- [2] Includes all Credit Suisse Options with at least one day with trading during the Proposed Class Period.
- [3] Includes only Credit Suisse Options analyzed in Exhibits 11A and 11B of the Cain Report.

Credit Suisse Options
Distribution of Per-Option Daily Trading Volume
on Days Analyzed by Dr. Cain^[1]
10/27/22–3/17/23

All Options	# Options	Mean	10%	25%	Median	75%	90%
Calls	375	322	0	3	40	247	839
Puts	365	518	0	1	18	235	955
All Options	740	418	0	1	32	240	934
Options Analyzed in the Cain Report^[2]							
Calls	11	511	23	74	207	445	1,425
Puts	11	564	18	99	186	741	1,187
All Options	22	538	19	68	206	545	1,401
Options Not Analyzed in the Cain Report^[3]							
Calls	364	316	0	2	36	240	760
Puts	354	516	0	1	16	228	906
All Options	718	415	0	1	27	232	886

Source: CBOE; Cain Report and Production

Note:

[1] Includes all Credit Suisse Options (i) with at least one day with trading during the Proposed Class Period and (ii) with at least one quote during the 11 days analyzed by Dr. Cain in Exhibits 11A and 11B of the Cain Report that are also in the Proposed Class Period. For these Credit Suisse Options, this table summarizes the distribution of the per-option average daily trading volume across the 11 days analyzed by Dr. Cain in Exhibits 11A and 11B of the Cain Report. Trading volume represents the number of options contracts purchased or sold. Each option contract is written on 100 shares of Credit Suisse ADSs.

[2] Includes only Credit Suisse Options analyzed in Exhibits 11A and 11B of the Cain Report.

[3] Excludes Credit Suisse Options analyzed in Exhibits 11A and 11B of the Cain Report.

Credit Suisse Options
Distribution of Aggregate Daily Trading Volume^[1]
10/27/22–3/17/23

All Days in Proposed Class Period	# Days	Mean	10%	25%	Median	75%	90%
Calls	97	16,778	1,972	4,353	6,823	10,862	23,506
Puts	97	20,038	1,754	3,270	5,850	13,134	23,414
All Options	97	36,816	5,234	7,754	14,284	23,678	49,465
All Days Analyzed in the Cain Report^[2]							
Calls	11	48,445	5,190	6,533	14,917	34,561	54,426
Puts	11	63,028	5,904	10,681	14,577	36,061	50,170
All Options	11	111,473	13,418	17,766	28,051	77,494	90,852
All Days Not Analyzed in the Cain Report^[3]							
Calls	86	12,728	1,912	3,884	6,743	10,577	17,401
Puts	86	14,539	1,645	3,024	5,038	9,940	20,722
All Options	86	27,266	5,100	7,450	12,973	18,705	37,686

Source: CBOE; Cain Report and Production

Note:

- [1] Includes all Credit Suisse Options with at least one day with trading during the Proposed Class Period. Trading volume represents the number of options contracts purchased or sold. Each option contract is written on 100 shares of Credit Suisse ADSs.
- [2] Includes only the 11 days analyzed by Dr. Cain in Exhibits 11A and 11B of the Cain Report that are also in the Proposed Class Period.
- [3] Excludes the 11 days analyzed by Dr. Cain in Exhibits 11A and 11B of the Cain Report that are also in the Proposed Class Period.

Credit Suisse Options
Distribution of Per-Option Average Bid-Ask Spread^[1]
10/27/22–3/17/23

All Options	# Options	Mean	10%	25%	Median	75%	90%
Calls	384	43.9%	11.7%	16.0%	31.0%	66.2%	94.2%
Puts	377	27.6%	5.9%	9.2%	18.3%	38.4%	65.8%
All Options	761	35.8%	7.8%	13.1%	24.5%	51.6%	79.6%
Options Analyzed in the Cain Report^[2]							
Calls	10	29.7%	17.8%	20.7%	30.5%	37.0%	41.1%
Puts	11	36.2%	21.3%	25.1%	34.1%	49.2%	54.5%
All Options	21	33.1%	18.0%	21.7%	31.0%	40.8%	53.7%
Options Not Analyzed in the Cain Report^[3]							
Calls	374	44.2%	11.6%	15.7%	31.3%	66.7%	94.8%
Puts	366	27.4%	5.7%	9.1%	17.8%	38.2%	66.7%
All Options	740	35.9%	7.8%	12.9%	24.1%	52.2%	79.8%

Source: CBOE; Cain Report and Production

Note:

[1] Bid-ask spread is calculated as ask price less bid price, divided by the average of the bid price and the ask price. For each Credit Suisse Option, the average bid-ask spread is calculated across all days during the Proposed Class Period where the bid price, ask price, and trade volume are positive.

[2] Includes only Credit Suisse Options analyzed in Exhibits 11A and 11B of the Cain Report.

[3] Excludes Credit Suisse Options analyzed in Exhibits 11A and 11B of the Cain Report.

Credit Suisse Options
Distribution of the Per-Option Frequency of Trading Days
with Zero Trading Volume^[1]
10/27/22–3/17/23

All Options	# Options	Mean	10%	25%	Median	75%	90%
Calls	453	60.9%	13.4%	38.8%	69.7%	88.1%	94.1%
Puts	431	62.3%	12.9%	41.4%	71.4%	89.5%	95.5%
All Options	884	61.6%	13.3%	39.8%	70.1%	88.2%	95.1%
Options Analyzed in the Cain Report^[2]							
Calls	11	38.1%	0.0%	6.7%	30.0%	68.3%	80.6%
Puts	11	19.7%	0.0%	1.5%	11.5%	32.8%	36.7%
All Options	22	28.9%	0.0%	0.7%	22.9%	53.3%	69.7%
Options Not Analyzed in the Cain Report^[3]							
Calls	442	61.5%	14.3%	40.0%	70.0%	88.1%	94.1%
Puts	420	63.4%	15.3%	43.2%	71.8%	90.0%	95.6%
All Options	862	62.4%	14.3%	41.7%	71.1%	88.5%	95.2%

Source: CBOE; Cain Report and Production

Note:

[1] Includes all Credit Suisse Options with at least one day with trading during the Proposed Class Period. For each of these Credit Suisse Options, the frequency of days with zero trading volume is calculated as the number of trading days with both a quote and zero trading volume divided by the number of days with a quote during the Proposed Class Period.

[2] Includes only Credit Suisse Options analyzed in Exhibits 11A and 11B of the Cain Report.

[3] Excludes Credit Suisse Options analyzed in Exhibits 11A and 11B of the Cain Report.